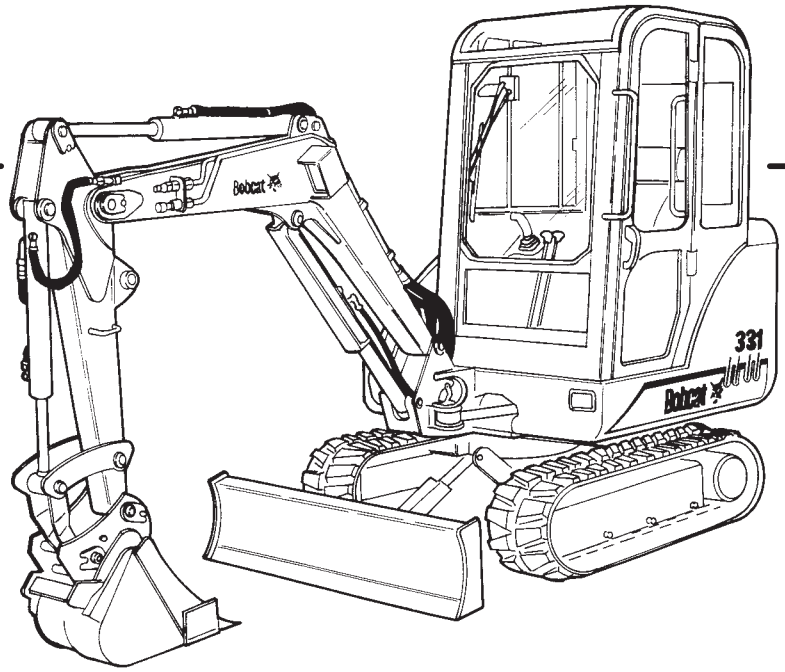
331
331E
334

Bobcat®

Operation & Maintenance Manual

331 – S/N 232511001 & Above
331E – S/N 232711001 & Above
334 – S/N 232611001 & Above
(D Series)



An IR Ingersoll-Rand business

6901957 (2–03) Revised (5–03) (3)

Printed in U.S.A.

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OPERATOR SAFETY WARNINGS

⚠ WARNING

Operator must have instructions before running the machine. Untrained operators can cause injury or death.

W–2001–1285

⚠ **Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.**

CORRECT

B–10731

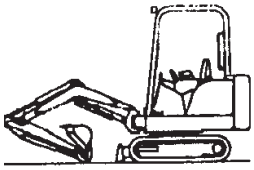
⚠ **Never operate without instructions. Read machine signs and Operation & Maintenance Manual.**

WRONG

MC–1862A

⚠ **Do not grasp control handles when entering canopy or cab.**
⚠ **Be sure controls are in neutral before starting.**
⚠ **Sound horn and check behind machine before starting.**

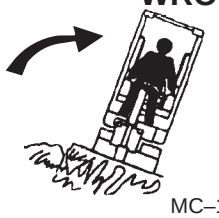
CORRECT



MC–1859A

⚠ **Never operate without approved canopy or cab.**
⚠ **Never modify equipment.**
⚠ **Never use attachments not approved by Bobcat Company.**

WRONG



MC–1865A

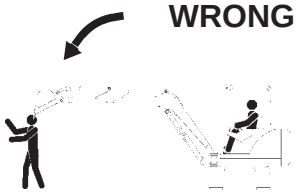
⚠ **Avoid steep areas or banks that could break away.**

WRONG

TS–2074

⚠ **Use caution to avoid tipping–do not swing heavy load over side of track.**
⚠ **Operate on flat, level ground.**

WRONG



TS–2075

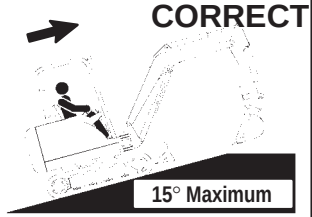
⚠ **Keep bystanders out of maximum reach area.**
⚠ **Do not travel or turn with bucket extended.**
⚠ **Never carry riders.**

CORRECT

MC–1865B

⚠ **Never exceed a 15° slope to the side.**

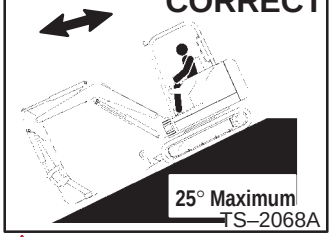
CORRECT



TS–2067A

⚠ **Never travel up a slope that exceeds 15°.**

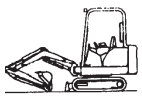
CORRECT



TS–2068A

⚠ **Never exceed 25° when going down or backing up a slope.**

CORRECT



MC–1859A

⚠ **To leave Excavator, lower the attachment.**
⚠ **Stop the engine.**

CORRECT

⚠ **Fasten seat belt securely.**
⚠ **Operate controls only from operator's seat.**

SAFETY EQUIPMENT

1. **Seat Belt**
2. **Swing Lock**
3. **ROPS/TOPS Canopy or Cab**
4. **Machine Safety Signs**
5. **Safety Tread**
6. **Grab Handles**

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CONTENTS

CALIFORNIA
PROPOSITION 65 WARNING
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

REFERENCE INFORMATION

Write the correct information for YOUR Bobcat Excavator in the spaces below. Always use these numbers when referring to your Excavator.

Bobcat Excavator
Serial Number . . . . . _____
Engine Serial Number . . . . . _____
_____
_____
_____

NOTES: _____
_____
_____
_____
_____
_____

YOUR BOBCAT EXCAVATOR DEALER: _____
ADDRESS: _____
PHONE: _____

Bobcat Company
P.O. Box 128
Gwinner, ND 58040–0128

Bobcat Company Europe
J. Huysmanslaan 59
B–1651 LOT
BELGIUM

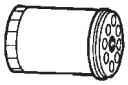
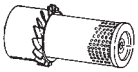
Bobcat Company is ISO 9001 certified

ISO 9001 is a set of international standards that control the processes and procedures which we use to design, develop, manufacture, distribute, and service Bobcat products.

British Standards Institute (**BSI**) is the Certified Registrar Bobcat Company chose to assess the Company's compliance with the ISO 9001 set of standards. The BSI registration certifies that the two Bobcat Company manufacturing plants and the Bobcat Company corporate offices (Gwinner, Bismarck & West Fargo) in North Dakota are in compliance with ISO 9001. Only certified assessors, like BSI, can grant registrations.

ISO 9001 means that as a company we say what we do and do what we say. In other words, we have established procedures and policies, and we provide evidence that the procedures and policies are followed.

REGULAR MAINTENANCE ITEMS

	3974896	ENGINE OIL FILTER
	6667352	FUEL FILTER
	6666333 6666334	PRIMARY AIR CLEANER SECONDARY AIR CLEANER
	6646678	RADIATOR CAP
	6670207 6660728	HYDRAULIC FILTER HYDRAULIC FILTER (Case Drain)
	6670251	BATTERY
	6724094	PROPYLENE GLYCOL ANTI–FREEZE, Premixed – [–34°F (–37°C)]
	6724354	PROPYLENE GLYCOL ANTI–FREEZE, Concentrate
	6563328	BLACK GOLD Hydraulic/Hydrostatic Fluid – 5 Gallons
	6657299	MOTOR OIL 15W40 CE/SG – 1 Qt.
	6657301	MOTOR OIL 10W30 CE/SG – 1 Qt.
	6657303	MOTOR OIL 30 CE/SG – 1 Qt.

FOREWORD

This manual gives the owner/operator necessary operating, and preventive maintenance instructions for the Bobcat Excavator.

Read this manual completely and know the Bobcat Excavator before operating and servicing it. All references to *left* or *right* on the excavator are given in relation to the operator's left or right hand while in the operator's seat.

For further information, see your Bobcat Excavator dealer. Parts Manuals, Service Manuals and extra Operation & Maintenance Manuals are also available.

The Bobcat Compact Excavator Operator Training Course is available from your Bobcat dealer.

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SERIAL NUMBER LOCATIONS

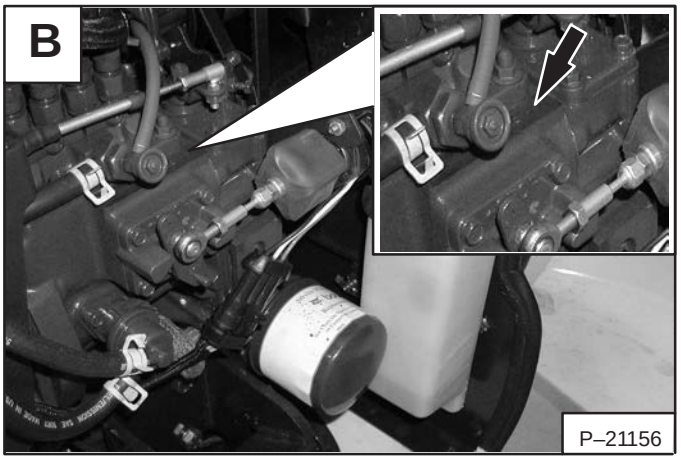
Always use the FULL serial number (including the first four digits) when requesting service or when ordering parts. Early or later models (identification made by serial number) may use different parts, or it may be necessary to use a different procedure in doing a specific service operation.

Bobcat Excavator Serial Number

The Bobcat Excavator serial number is on the frame of the machine in the location shown **[A]**.

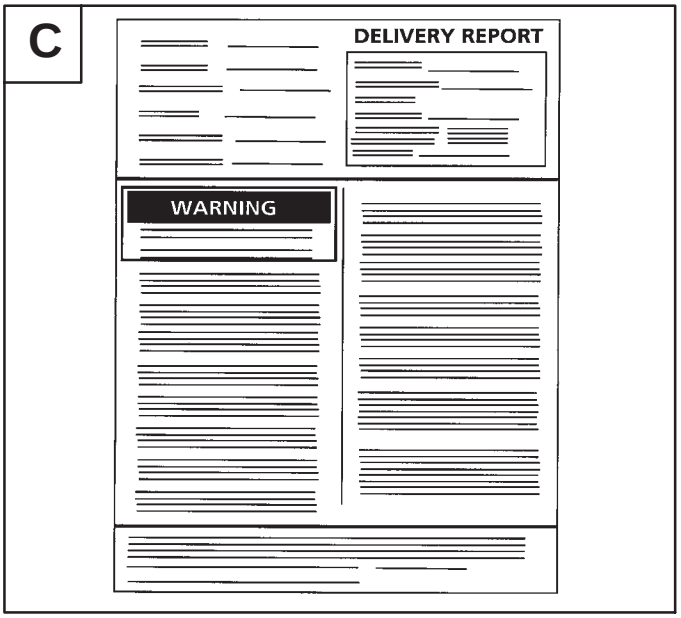
Engine Serial Number

The engine serial number is located on the engine in the location shown **[B].**

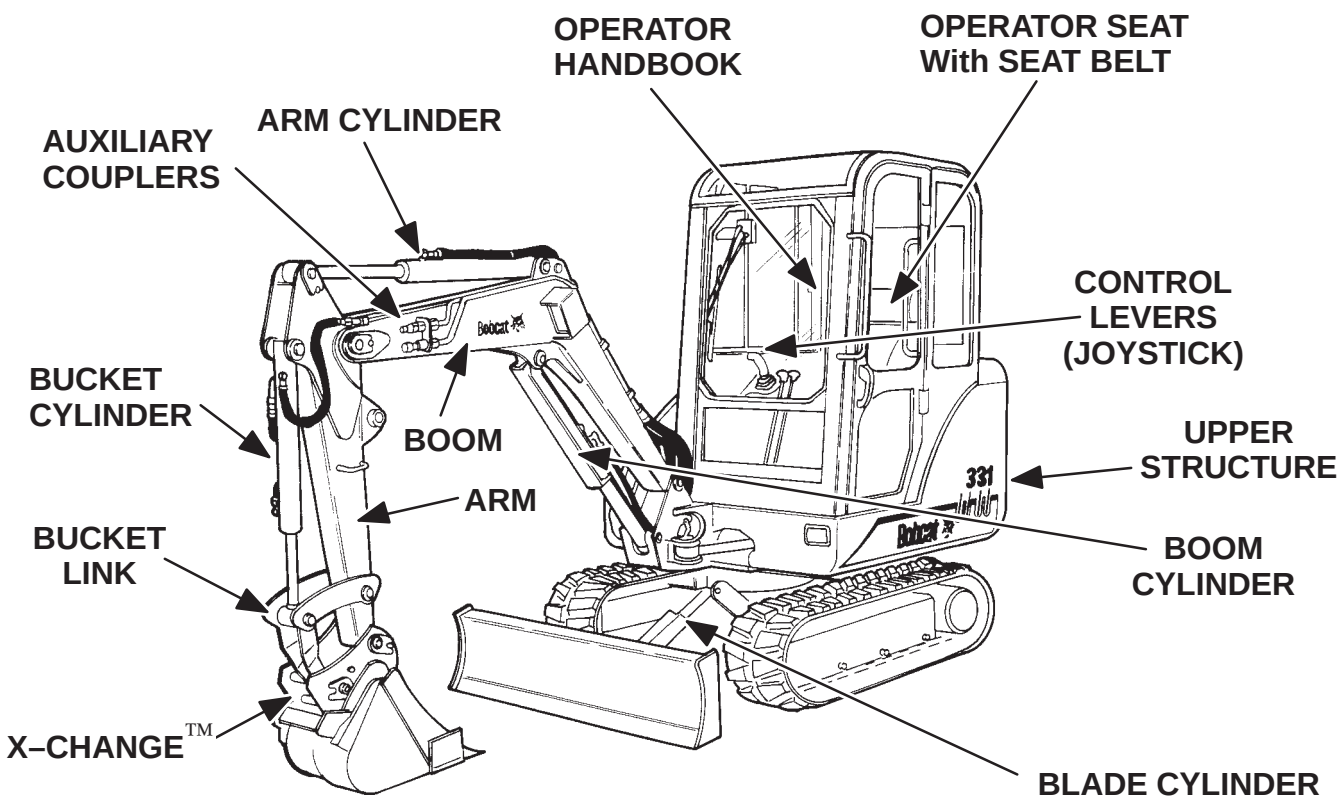


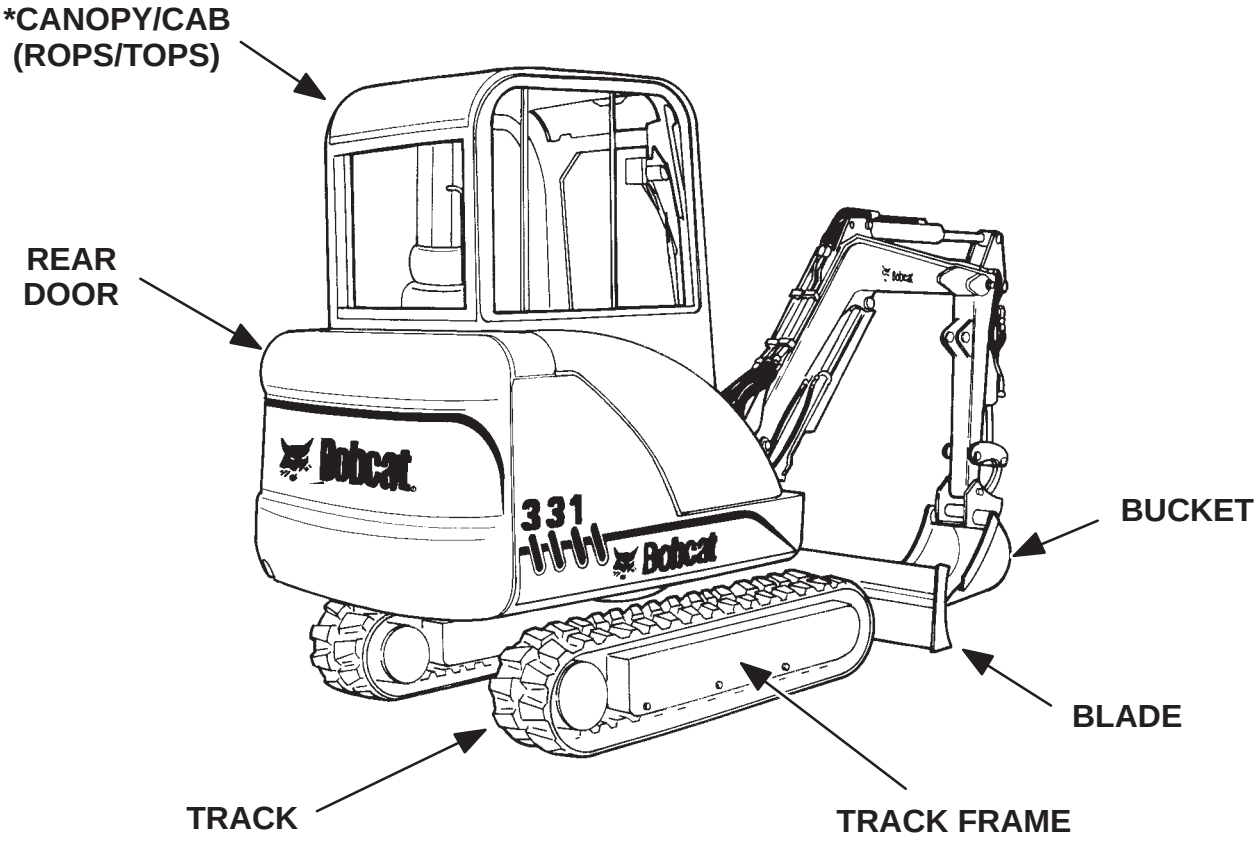
DELIVERY REPORT

The Delivery Report items must be explained to the owner/operator by the dealer. The dealer is to fill out the form and the owner/operator signs the form to indicate his understanding **[C]**.



BOBCAT EXCAVATOR IDENTIFICATION





*** FOGS (Falling Object Guards) is available from your Bobcat Excavator dealer**

FEATURES AND ACCESSORIES

Model 331, 331E & 334 Bobcat Excavators are equipped with the following Standard items:

60 inch (1524 mm) Dozer Blade
12.6 inch (320 mm) Rubber Tracks
Advanced Diagnostics
Auxiliary Hydraulics
Canopy with ROPS / TOPS Approval
Engine Shutdown Feature
Horn
Hydraulic and Travel Control Lockouts
Hydraulic Joystick Controls
ISO / STD Control Pattern Selection Feature
Hydraulically Extendable Arm (331E only)
Counterweight Kit (331, 334 only)
Rental Investment Protection System (RIPS)
Retractable Seat Belt
Suspension Seat
Spark Arrestor Muffler
Two–Speed Travel
Work Lights
X–Change Attachment Mounting System

Below is a list of some equipment available from your Bobcat Excavator dealer as Dealer and / or Factory Installed Accessories. See your Bobcat dealer for other available options, accessories and attachments.

Factory Options
Enclosed Cab
Enclosed Cab w/ Heater
or w/ Heater and Air Conditioning
Keyless Start
Steel Tracks

Dealer Installed Accessories
Cab Lights Kit
Counterweight Kit (331)
Extendable Arm Kit (334/334)
Heater Kit
Long Arm Kit (331)
Lifting Chain Kit
Special Applications Kit
Top Guard Kit (FOGS)
Travel Motion Alarm
Vinyl Cab Enclosure

Other
Excavator Operator Training Kit
Excavator Service Safety Training Kit

Specifications subject to change without notice

Bobcat®

SAFETY

Bobcat®

SAFETY INSTRUCTIONS FOR BOBCAT COMPACT EXCAVATORS AND ATTACHMENTS

SAFE OPERATION IS THE OPERATOR'S RESPONSIBILITY

Carefully follow the operating and maintenance instructions in this manual.

The Bobcat excavator is highly maneuverable and compact. It is rugged and useful under a wide variety of conditions. This presents an operator with hazards associated with off highway, rough terrain applications, common with Bobcat excavator usage.

The Bobcat excavator has an internal combustion engine with resultant heat and exhaust. All exhaust gases can kill or cause illness so use the excavator with adequate ventilation. The excavator has a spark arrestor exhaust system or muffler which is required for operation in certain areas.

The dealer explains the capabilities and restrictions of the Bobcat excavator and attachments for each application. The dealer demonstrates the safe operation according to Bobcat instructional materials, which are also available to operators. The dealer can also identify unsafe modifications or use of unapproved attachments. The attachments and buckets are designed for a Rated Lift Capacity and secure fastening to the Bobcat excavator. The user must check with the dealer, or Bobcat literature, to determine safe loads of materials of specified densities for the excavator–attachment combination.

The following publications and training materials provide information on the safe use and maintenance of the Bobcat excavator and attachments:

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the Bobcat excavator and attachment is in safe operating condition.
- The Operation & Maintenance Manual delivered with the Bobcat excavator or attachment gives operating information as well as routine maintenance and service procedures. It is a part of the machine and can be stored in a container provided inside the cab of the excavator. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Machine signs (decals) instruct on the safe operation and care of your Bobcat excavator or attachment. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat dealer.
- An Operator's Handbook is fastened to the operator cab of the excavator. Its brief instructions are convenient to the operator. The Handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.
- The Safety Manual delivered with the Bobcat excavator gives general safety information.
- Operator Training Courses are available from your local Bobcat dealer. They provide information for safe and efficient operation of the Bobcat excavator and some attachments. The courses are available in English and Spanish versions.
- The Service Safety Training Course is available from your Bobcat dealer. This course provides information for safe and correct service procedures for Bobcat Excavators.
- See the *ADDITIONAL PUBLICATIONS* Page in this manual or your Bobcat dealer for Service and Parts Manuals, printed material, videos, or training courses available. Also check the Bobcat web site **www.bobcat.com**

The dealer and owner/operator review the recommended uses of the product when delivered. If the owner/operator will be using the machine for a different application(s) he must ask the dealer for recommendations on the new use.

Call Before You Dig
1–888–258–0808

When you call, you will be directed to a location in your state/city for information about buried lines (telephone, cable TV, water, sewer, gas, etc.)

SI22–0402

BEFORE OPERATING THE BOBCAT COMPACT EXCAVATOR

Safety Alert Symbol

This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

The Bobcat excavator and attachment must be in good operating condition before use.

Check all of the items on the Bobcat Service Schedule Decal under the 8–10 hour column or as shown in this Manual.

WARNING

Operator must have instructions before running the machine. Untrained operators can cause injury or death.

W–2001–1285

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine.

I–2019–0284

SAFE OPERATION NEEDS A QUALIFIED OPERATOR *

A QUALIFIED OPERATOR MUST DO THE FOLLOWING:

- **UNDERSTAND THE WRITTEN INSTRUCTIONS, RULES AND REGULATIONS**
  - The written instructions from Bobcat Company include the Delivery Report, Operation & Maintenance Manual, Operator's Handbook, Safety Manual and machine signs (decals).
  - Check the rules and regulations at your location. The rules may include an employer's work safety requirements. Regulations may apply to local driving requirements or use of a Slow Moving Vehicle (SMV) emblem. Regulations may identify a hazard such as a utility line.

WARNING

Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause injury or death.

W–2044–1285

- **HAVE TRAINING WITH ACTUAL OPERATION**
  - Operator training must consist of a demonstration and verbal instruction. This training is given by your Bobcat dealer before the product is delivered.
  - The new operator must start in an area without bystanders and use all the controls until he can operate the machine and attachment safely under all conditions of the work area. Always fasten seat belt before operating.
  - Operator Training Courses are available from your Bobcat dealer in English and Spanish. They provide information for safe and efficient equipment operation. Safety videos are also available.
- **KNOW THE WORK CONDITIONS**
  - Know the weight of the materials being handled. Avoid exceeding the Rated Lift Capacity of the machine. Material which is very dense will be heavier than the same volume of less dense material. Reduce the size of load if handling dense material.
  - The operator must know any prohibited uses or work areas, for example, he needs to know about excessive slopes.
  - Know the location of any underground lines. Call local utilities or the TOLL FREE phone number found in the *SAFETY INSTRUCTIONS* Section of this manual.
  - Wear tight fitting clothing. Always wear safety glasses when doing maintenance or service. Safety glasses, hearing protection or special applications kit are required for some work. See your dealer about Bobcat Safety equipment.

* For an operator be qualified, he must not use drugs or alcoholic drinks which impair his alertness or coordination while working. An operator who is taking prescription drugs must get medical advice to determine if he can safely operate a machine.

SI23–0400

FIRE PREVENTION

The machines and some attachments have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

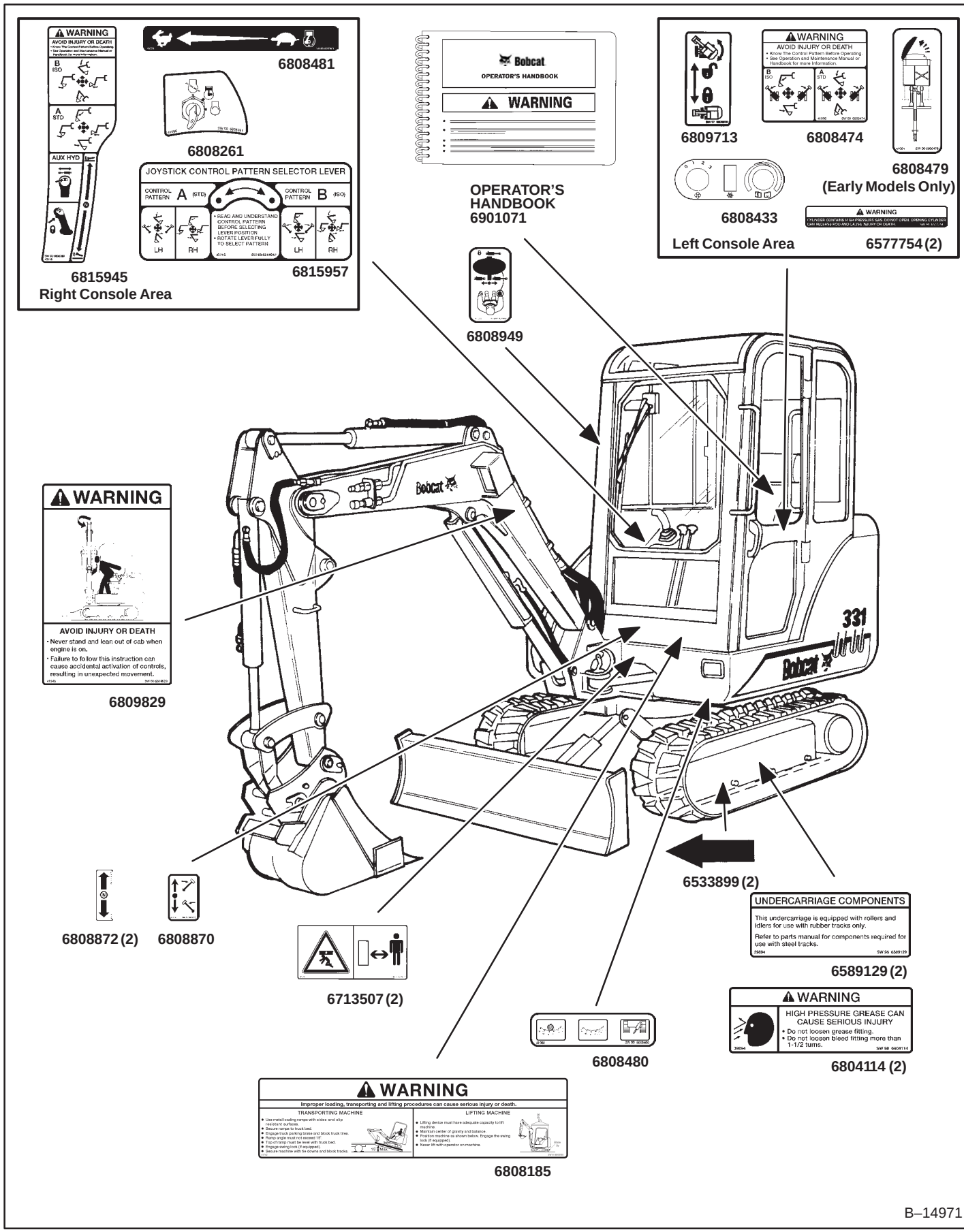
Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard.

The spark arrestor exhaust system (if equipped) is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.

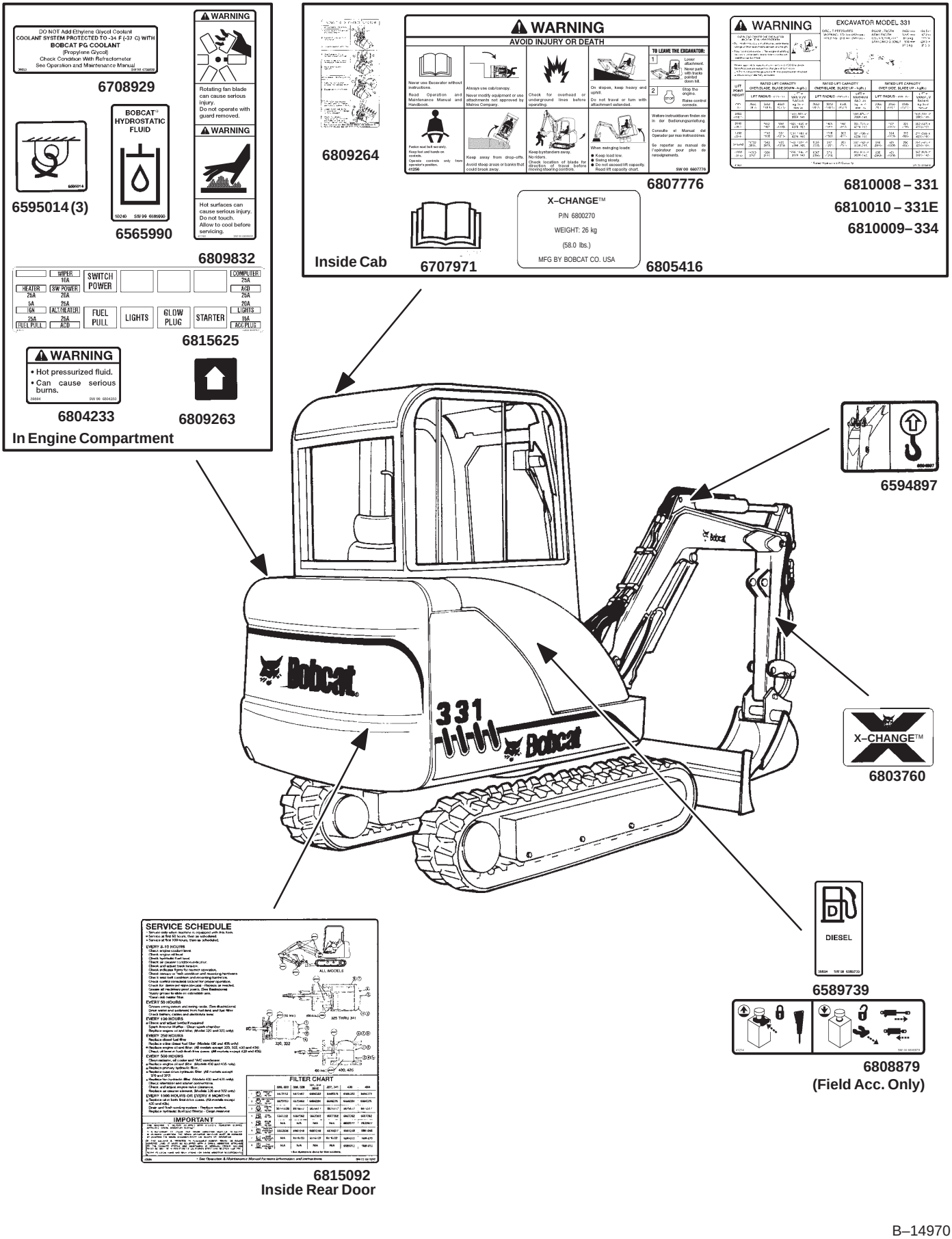
- Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.
- The operator cab, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.
- Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part.
- Check fuel and hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Tighten or replace any parts that show leakage. Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.
- Do not use ether or starting fluids on any engine which has glow plugs. These starting aids can cause explosion and injure you or bystanders.
- Always clean the machine, disconnect the battery, and disconnect the wiring from the electronic controllers before welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the machine when welding. Have good ventilation when grinding or welding painted parts. Wear dust mask when grinding painted parts. Toxic dust or gas can be produced.
- Stop the engine and let it cool before adding fuel. No smoking!
- Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.
- Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrestor muffler (if equipped).
- Know where fire extinguishers and first aid kits are located and how to use them. Fire extinguishers are available from your Bobcat dealer.

MACHINE SIGNS (DECALS)

Follow the instructions on all the Machine Signs (Decals) that are on the excavator. Replace any damaged machine signs and be sure they are in the correct locations. Machine signs are available from your Bobcat Excavator dealer.



MACHINE SIGNS (DECALS) (Cont'd)



B–14970

Bobcat®

OPERATING INSTRUCTIONS

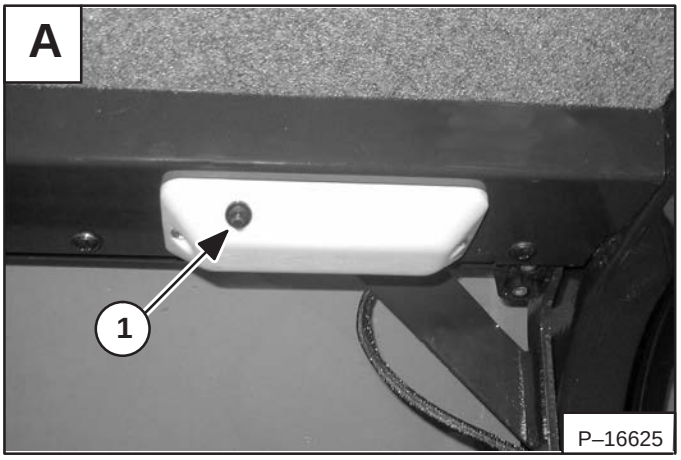
Continued On Next Page

OPERATING INSTRUCTIONS (Cont'd)

INSTRUMENTS AND CONSOLES

Cab Interior Light (If Equipped)

Press the button (Item 1) **[A]** to turn the light ON. Press again to turn OFF.



Left Console [B]

1. **Left Control Lever (Joystick) –** (See *HYDRAULIC CONTROLS* Page 11.
2. **Horn –** Press the button on the Control Lever to sound the horn.

Heater / Air Conditioner (With Cab Option Only)

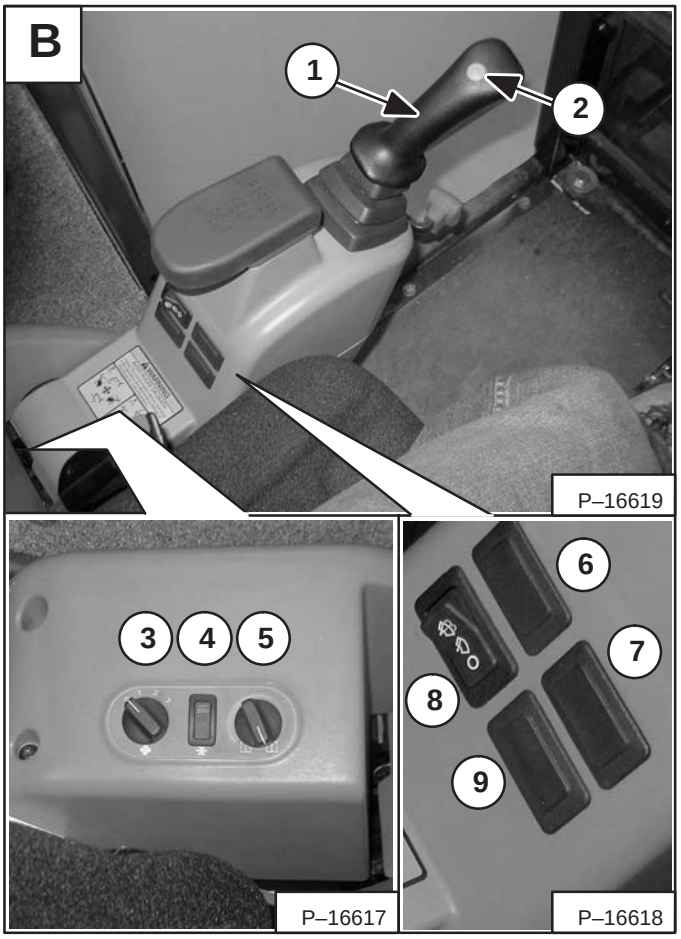
3. **Fan Motor –** Turn clockwise to increase fan speed; counterclockwise to decrease. There are four positions; OFF – 1 – 2 – 3.
4. **Air Conditioner –** Press the top of the switch to turn the Air Conditioner ON (light in switch will be ON); press bottom to turn OFF.
5. **Temperature Control –** Turn clockwise to increase temperature; counterclockwise to decrease.

Switch Panel

6. Future Use
7. Future Use
8. **Wiper / Washer Switch –** Press the switch to the left to start the wiper. The switch will stay in this position.

   Press to the right to turn the wiper OFF.

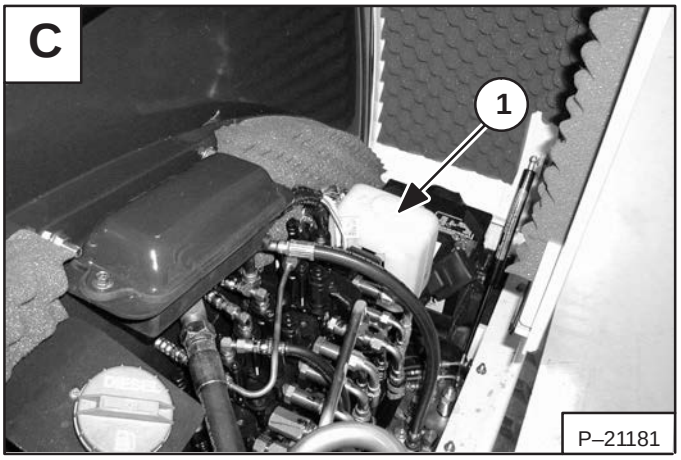
   Press and hold to the left to turn the washer ON to help clean the window. The switch will return to the ON position when released
9. Future Use



Wiper / Washer Fluid Reservoir (If Equipped)

The reservoir (Item 1) **[C]** is located under the access cover on the right side of the excavator.

Use an antifreeze washer solution in freezing temperatures.



INSTRUMENTS AND CONSOLES (Cont'd)

Right Console [A]

1. **Right Control Lever (Joystick) –** (See *HYDRAULIC CONTROLS* Page 11.)
2. **Auxiliary Hydraulics Switch –** Controls the fluid flow to the auxiliary quick couplers (attachment).♦
3. **Blade Control Lever –** Controls raising and lowering the blade. (See *BLADE CONTROL LEVER,* Page 14.)
4. **Two–Speed Button –** Engages and disengages High Range travel speed. (See *TWO–SPEED TRAVEL,* Page 6.)
5. **Speed Control Lever –** Controls the RPM of the engine.
6. **Key Switch *(Base Panel Only)* –** (Always perform the *PRE–STARTING PROCEDURE* Page 16 before starting the engine. See *STARTING THE ENGINE* Page 19.) (See Item 14 for Keyless Start.)

   STOP – Key switch OFF; engine stopped.
   RUN (ON) – Position when the engine is running.
   START – Start the engine.

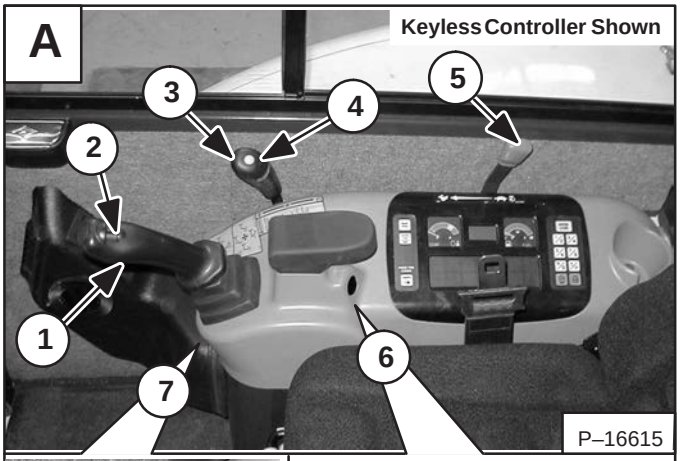
NOTE: Always turn key switch and all accessories to OFF position when the engine is stopped. The battery will discharge if the key is left ON. Audible alarm will sound if the key is in the RUN position with the engine stopped.

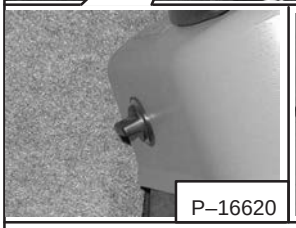
7. **Auxiliary Power Outlet –** Provides 12 Volt receptacle for accessories.
8. **Auxiliary Hydraulic Button –** Activates and deactivates auxiliary hydraulic function.♦
9. **HOURS / JOB / RPM –** Press to show HOURS, JOB CLOCK or Engine RPM in LCD (Liquid Crystal Display, Item 12.)*****
10. **LIGHTS / HOLD FOR CODES –** Press once to turn lights ON; press again to turn lights OFF. Press and hold two seconds for display of SERVICE CODES in LCD (Item 12)
11. **TEMPerature Gauge –** Shows the engine coolant temperature.
12. **LCD (Liquid Crystal Display) –** The LCD is the HOURMETER during normal operation of the excavator. When preheat is activated, the LCD will show remaining preheat time. Can also be used to display JOB CLOCK or Engine RPM.*****
13. **FUEL Gauge –** Shows the amount of fuel in the tank.
14. **Keyless Start *(Keyless Controller Only)* –** (Always perform the *PRE–STARTING PROCEDURE*, Page 16 before starting the engine. See *STARTING THE ENGINE* Page 19.)
15. **Function Icons –** (See *Function Icons*, Page 5.)
16. **JOB –** On when JOB CLOCK is activated*****
17. **RPM –** On when Engine RPM is activated*****
18. **ACD –** On when **A**ttachment **C**ontrol **D**evice is activated*****

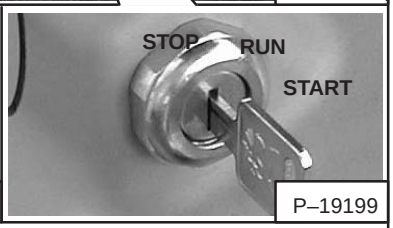
♦ (See *Auxiliary Hydraulics,* Page 13.)
***** (See *SYSTEM SETUP AND ANALYSIS*, Page 59.)

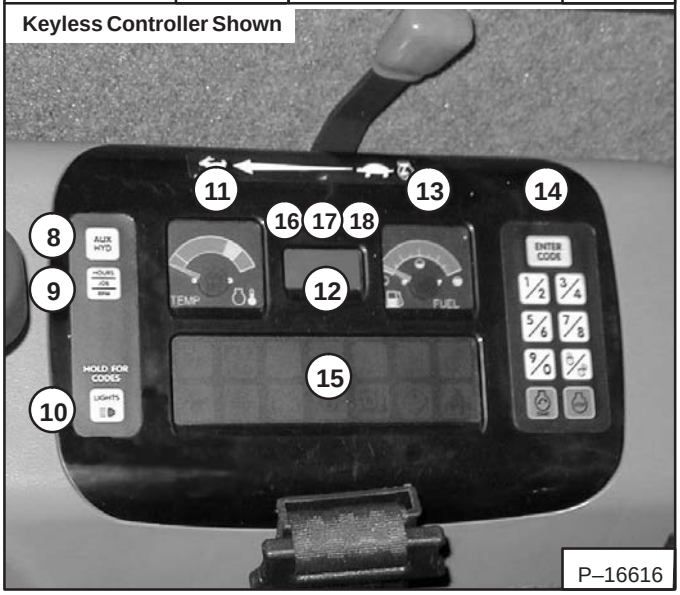
STD / ISO SELECTOR VALVE

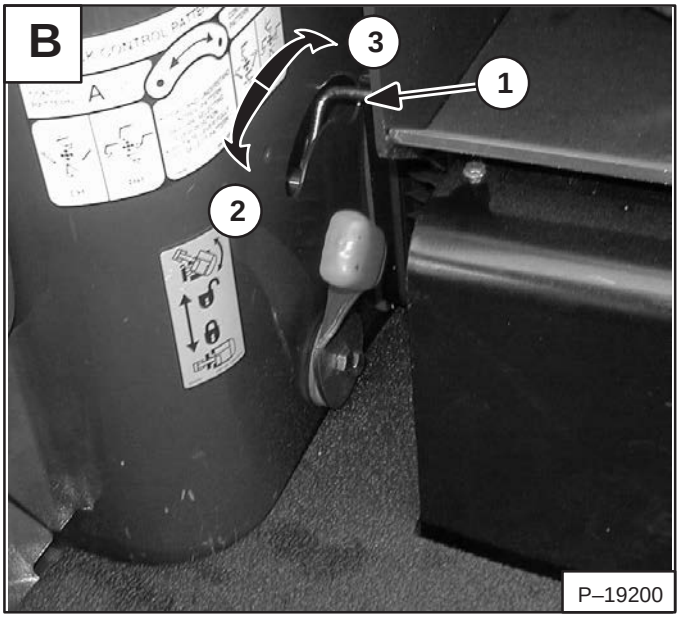
Move the lever (Item 1) **[B]** to the front (Item 2) **[B]** to select STANDARD Control Pattern. Move to the rear (Item 3) **[B]** to select ISO Control Pattern. (See *HYDRAULIC CONTROLS*, Page 11.)











INSTRUMENTS AND CONSOLES (Cont'd)

Function Icons

The right console contains the instrument panel with Function Icons **[A]**.

The table below shows the Icons, their function and other important information.

Ref.	Function	Icon / Light	Alarm	Condition / Code	Description
1	Auxiliary Hydraulics	OFF CONTINUOUS FLASHING	– – – – 3 Beeps	– – – – Error ◊	Auxiliary Hydraulics Button pressed, hydraulic functions available. Error with Auxiliary Hydraulics
2	Two–Speed Travel	OFF CONTINUOUS FLASHING	– – – – 3 Beeps	– – – – Error ◊	– – Two–Speed activated, High Range engaged Solenoid Error
	NOTE: Two–Speed is disabled during high engine coolant temperature or high hydraulic fluid temperature.				
3	Hydraulic / Traction Drive	CONTINUOUS OFF FLASHING FLASHING	– – – – 3 Beeps CONTINUOUS	• Error ◊ Error ◊	Left Console down. Hydraulic / Traction Drive functions activated Left Console up. Hydraulic / Traction Drive functions deactivated Error with console sensor or workgroup solenoid Workgroup solenoid not connected
4	Glow Plugs	OFF CONTINUOUS FLASHING	– – – – 3 Beeps	• – – Error ◊	 Glow Plugs energized Error with Glow Plugs
5	System Voltage	OFF FLASHING CONTINUOUS FLASHING CONTINUOUS	– – 3 Beeps 3 Beeps CONTINUOUS CONTINUOUS	• Error ◊ Warning ◊ Warning ◊ Shutdown ◊	 Voltage out of range Voltage low or high Voltage extremely high Voltage extremely low – Engine will stop in 10 seconds.
6	Engine Oil Pressure	OFF FLASHING	– – CONTINUOUS	• Shutdown ◊	 Engine Oil Pressure is extremely low – Engine will stop in 10 seconds.
7	Hydraulic Oil Filter & Temperature	OFF FLASHING CONTINUOUS CONTINUOUS FLASHING	– – 3 Beeps 3 Beeps 3 Beeps CONTINUOUS	• Warning ◊ Error ◊ Warning ◊ Shutdown ◊	 Error with Hydraulic Filter Hydraulic Oil Temperature out of range Hydraulic Filter plugged or temperature high Hydraulic Oil Temp. extremely high – Engine will stop in 10 seconds.
	NOTE: Two–Speed is disabled during high engine coplant temperature or high hydraulic fluid temperature.				
8	General Warning	OFF CONTINUOUS CONTINUOUS FLASHING	– – 3 Beeps 3 Beeps CONTINUOUS	• Error ◊ Warning ◊ Shutdown ◊	 Error with one or more engine, hydraulic, or fuel functions. Low fuel, engine speed high, coolant temperature high Coolant temperature or engine speed extremely high – Engine will stop in 10 seconds.
9	Keypad Unlocked	CONTINUOUS CONTINUOUS FLASHING	3 Beeps 3 Beeps CONTINUOUS	Error ◊ Warning ◊ Shutdown ◊	Engine Oil Pressure sender out of range. Engine oil level low. Engine oil pressure very low. Engine will shutdown in 10 seconds.
10	Seat Belt	ON	– –	– –	Light stays on for 45 seconds to remind operator to fasten seat belt.

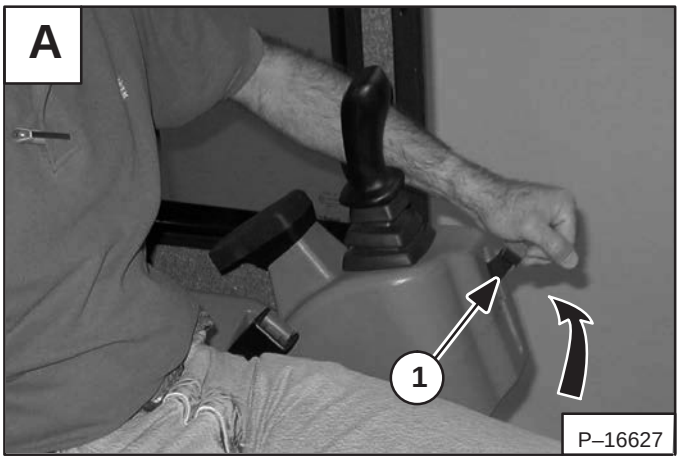
• This is the normal operating condition.
◊ These functions are monitored and have SERVICE CODES associated with them. See *SYSTEM SETUP & ANALYSIS* Page 59 for descriptions of SERVICE CODES.

INSTRUMENTS AND CONSOLES (Cont'd)

Raising And Lowering The Console

Raise the console before exiting the cab.

Pull up on the release handle (Item 1) **[A]**. The lift spring will assist in raising the console.



Lower the console before operating the excavator.

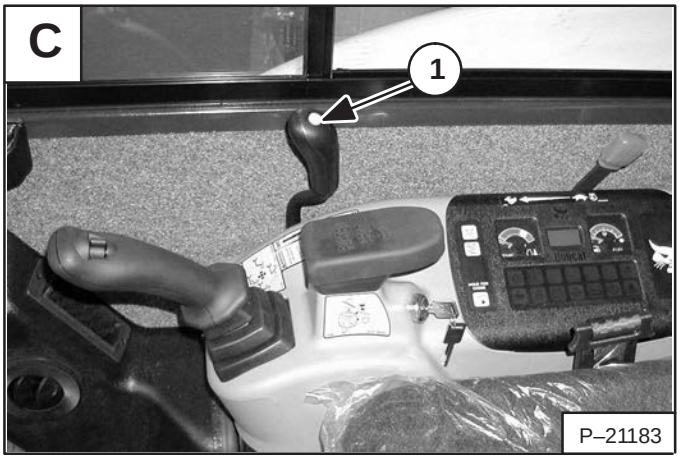
Push down on the console **[B]** until the latch is engaged.

NOTE: When the console is raised, the hydraulic and traction system functions are locked and will not operate.

TWO–SPEED TRAVEL

Push the button (Item 1) **[C]** to engage the High Range.

Press again to disengage.



TAILGATE

Opening And Closing The Tailgate

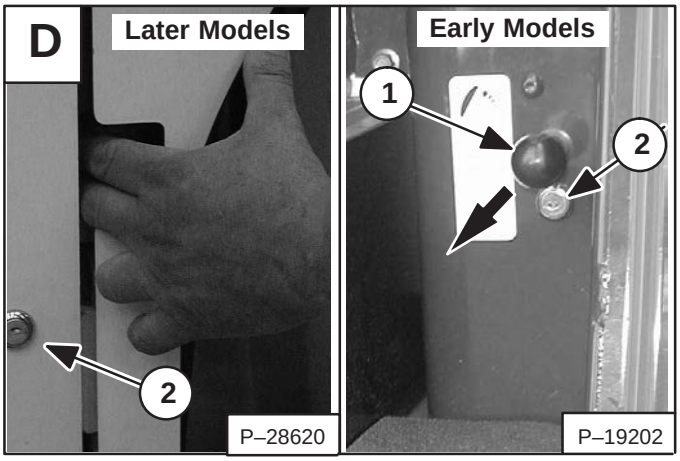
Later Models: Put your fingers into the opening on the left edge of the tailgate **[D]** and pull the latch release to the rear.

Early Models: Move the lever (Item 1) **[D]** forward to disengage the tailgate latch.

All Models: Pull the tailgate open to provide access for service.

Firmly push the tailgate closed to engage the latch.

The tailgate release can be locked (Item 2) **[D]**. Use the excavator key to unlock.



OPERATOR CANOPY (ROPS / TOPS)

The excavator has an operator canopy (ROPS/TOPS) (Roll Over Protective Structure/Tip Over Protective Structure) as standard equipment. The ROPS/TOPS meets ISO 12117.

An enclosed cab (ROPS/TOPS) is an Option or can be installed as a Field Accessory.

Both the cab and canopy provide operator protection if the excavator is tipped over. The seat belt must be worn for ROPS /TOPS protection.

⚠ WARNING

Never modify operator cab by welding, grinding, drilling holes or adding attachments unless instructed to do so by Melroe Company. Changes to the cab can cause loss of operator protection from rollover and falling objects, and result in injury or death.

W–2069–1285

FALLING OBJECT GUARDS (FOGS)

A cab or canopy FOGS (Falling Object Guards) (Item 1) **[A]** is available as a field installed accessory.

The FOGS provides additional protection from heavier objects which fall on the cab/canopy.

For the cab or canopy to meet the FOGS (Falling Object Guards) (ISO 10262–level 1), the excavator must have the overhead guard (Item 1) *and* Special Application Kit (Item 2) **[A]** installed.

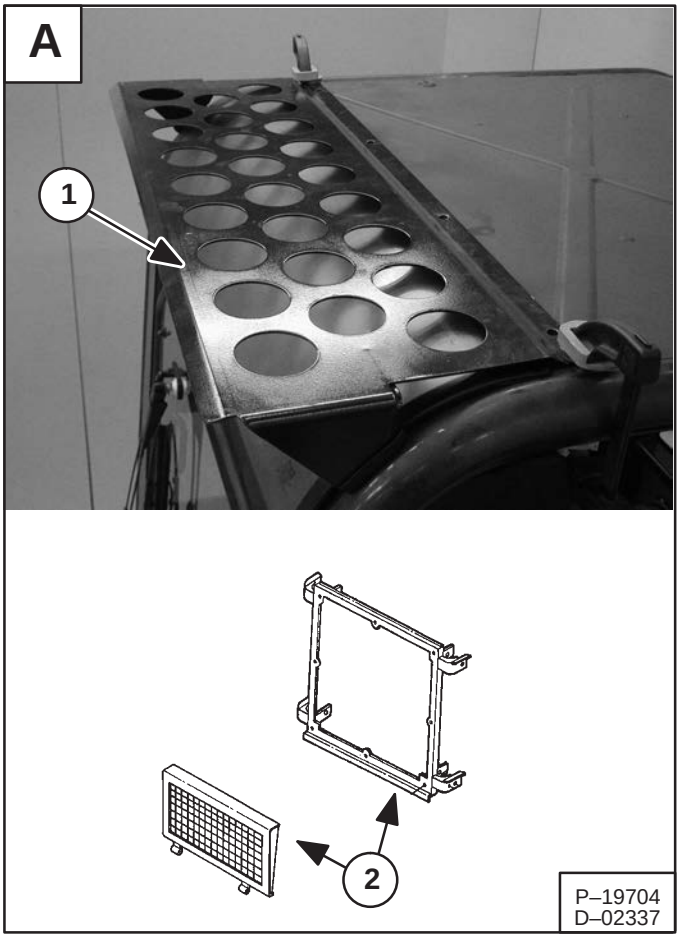
See your excavator dealer to order these kits.

CANOPY ENCLOSURE

A vinyl canopy enclosure kit **[B]** is available as a Field Accessory.

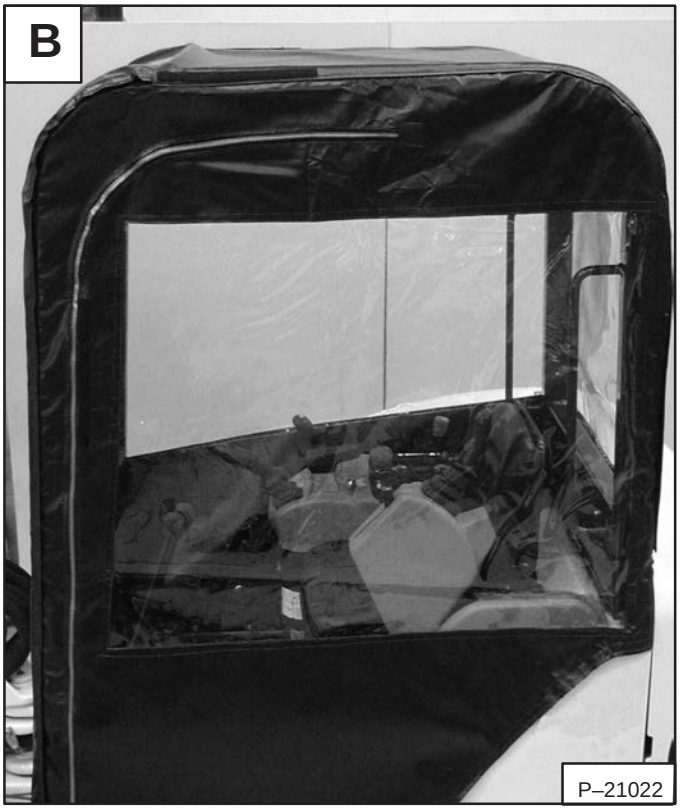
See your excavator dealer to order this part.

A



P–19704
D–02337

B



P–21022

SLEW LOCK

Move the lever (Item 1) **[A]** *down* to engage the Slew Lock. When the Slew Lock is engaged (locked), the upperstructure of the excavator is locked to the track frame and will not rotate. The upper structure must be parallel to the track frame to engage the Slew Lock.

Move the lever (Item 2) **[A]** *up* to disengage the upperstructure from the track frame. Secure the lever in the unlocked position.

⚠ WARNING

AVOID INJURY

The Swing Lock lever must be engaged when transporting the machine.

W–2197–0595

OPERATOR CAB (ROPS / TOPS) (If Equipped)

Emergency Exit

The left door and right rear window provide exits.

Slide the window to the front of the excavator and exit through the side window **[B]**.

Cab Door

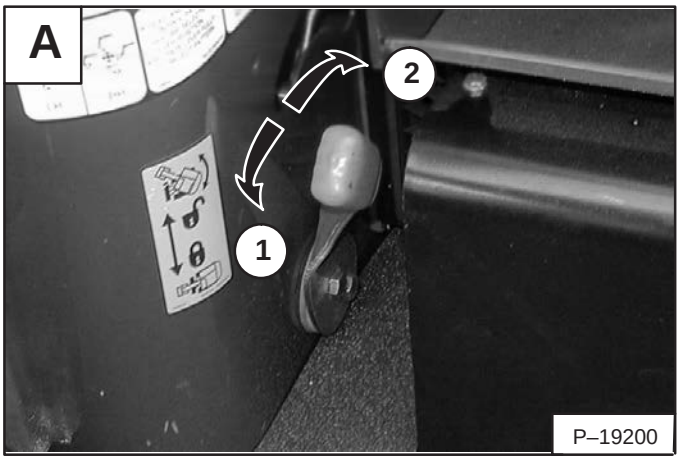
The cab door can be locked with the same key as the starter switch (if equipped).

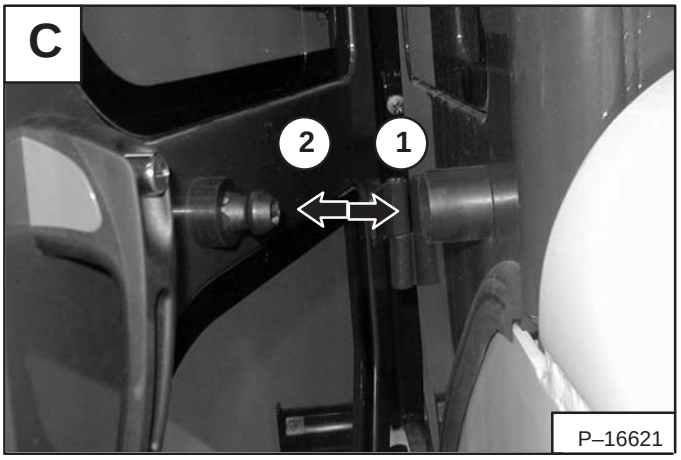
Push the door all the way open (Item 1) **[C]** until the latch engages to hold the door in the open position.

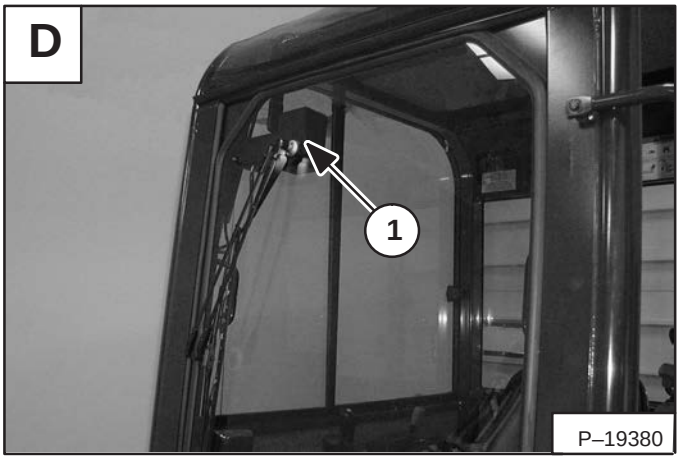
Firmly pull the door away from the cab (Item 2) **[C]** to disengage the latch and close the door.

Front Window

The front window is equipped with a wiper (Item 1) **[D]** and washer.





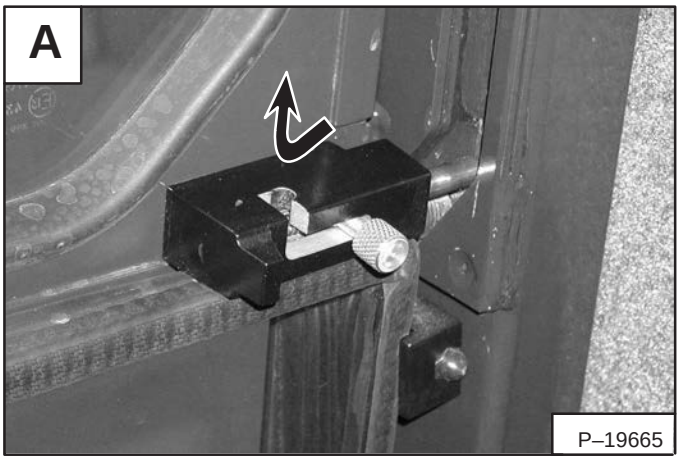


OPERATOR CAB (ROPS / TOPS) (Cont'd)

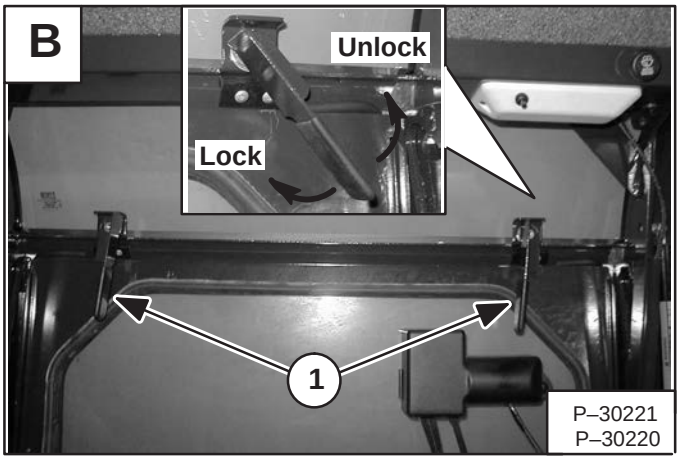
Front Window (Cont'd)

Opening The Front Window

Release the lower window latch pins and turn to the unlocked position **[A]**.



Turn the two top latches (Item 1) **[B]** to the unlocked position.



Use both window grab handles to pull the top of the window in **[C]**.

Continue moving the window in and up over the operator's head until the window engages the pocket at the top, rear of the cab.

Hold the bottom of the window up and lock the two window latch pins. Make sure that the pins are secured to hold the window up **[D]**.

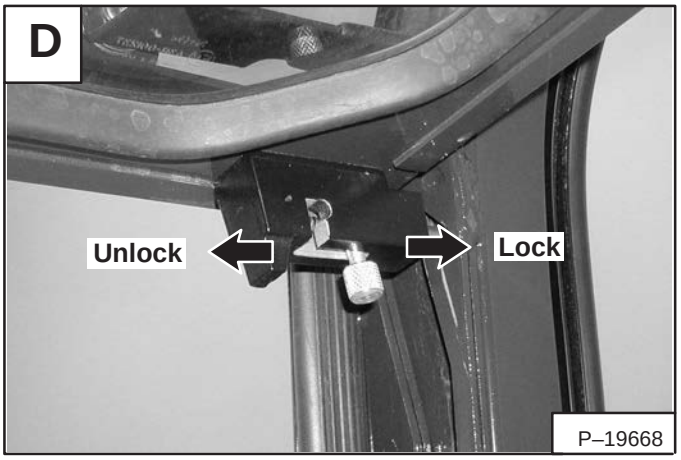
Closing The Front Window

Hold the bottom of the window up and release both window latch pins and put them in the unlocked position **[D]**.

Use both window grab handles to pull the window down **[C]**.

Rotate the top latches (Item 1) **[B]** to the locked position.

Lock the window latch pins **[A]** at the bottom of the window.



STEERING LEVERS / FOOT PEDALS

Forward And Reverse Travel

NOTE: The following procedures describe forward, reverse, left & right as seated in the operator's seat.

Put the blade so that it is at the front of the machine (as you sit in the operator's seat). Slowly move both steering levers***** (Item 1) **[A]** forward for forward travel; backward for reverse travel.

*****Travel can also be controlled with foot pedals (Item 2) **[A]**. Pivot the heel of the pedals forward for additional space on the floor.

⚠ WARNING

AVOID INJURY OR DEATH

- **Check the blade location before traveling. When the blade is to the rear, operate the steering levers/foot pedals in the opposite direction to when the blade is in the front.**
- **Move the steering levers/foot pedals slowly. Abrupt lever motion will cause the machine to jerk.**

W–2235–0396

Turning

Right Turn

Push the left steering lever forward to turn right **[B]** while traveling forward.

Pull the left steering lever backward to turn right **[D]** while traveling backward.

Counter–Rotation Right Turn

Push the left steering lever forward and pull the right steering lever backward **[F]**.

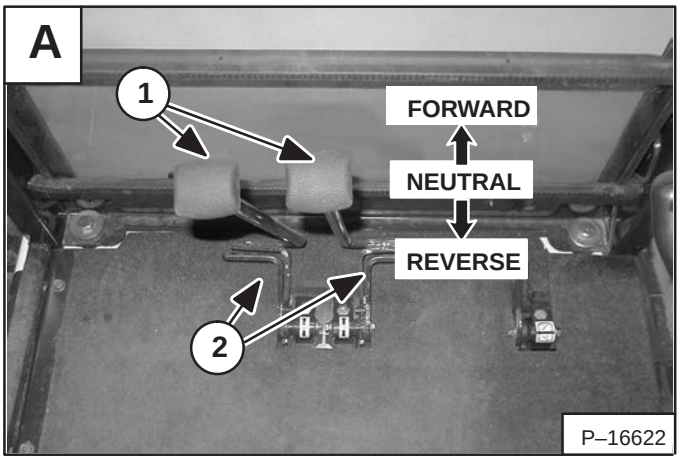
Left Turn

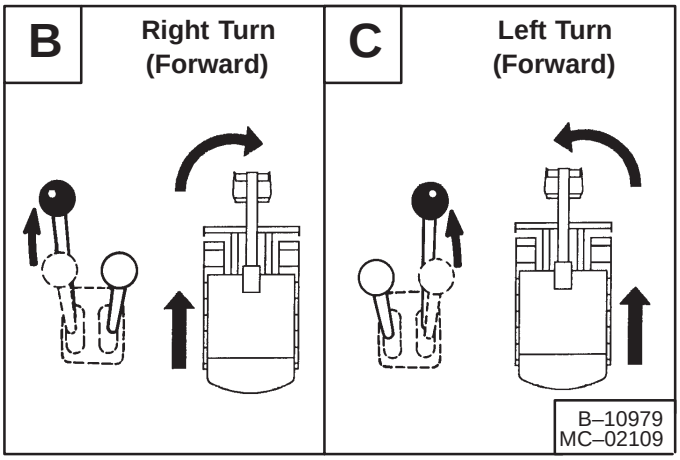
Push the right steering lever forward to turn left **[C]** while traveling forward.

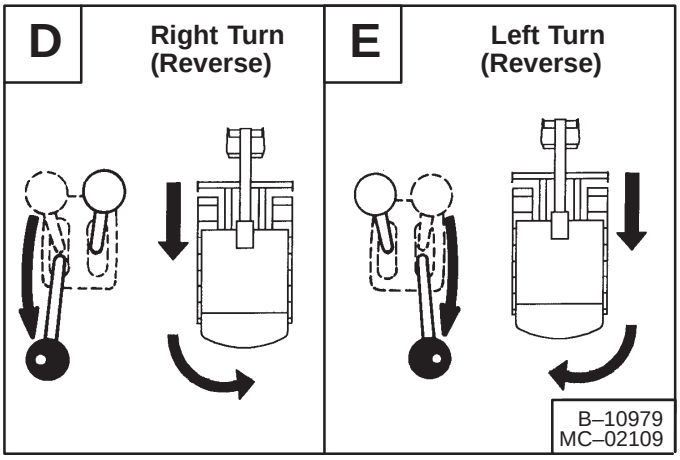
Pull the right steering lever backward to turn left **[E]** while traveling backward.

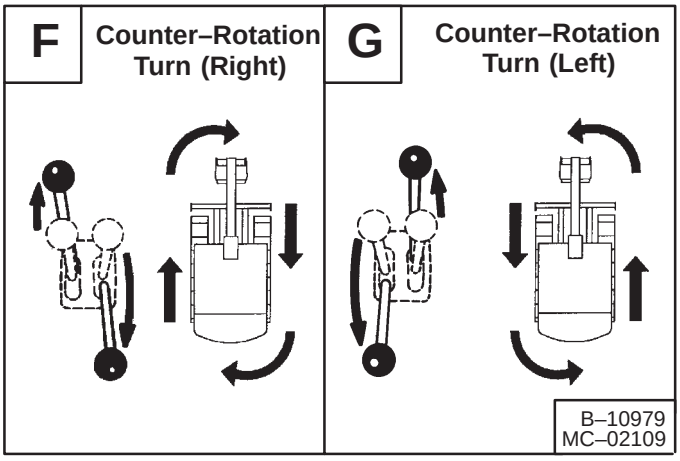
Counter–Rotation Left Turn

Push the right steering lever forward and pull the left steering lever backward **[G]**.









HYDRAULIC CONTROLS

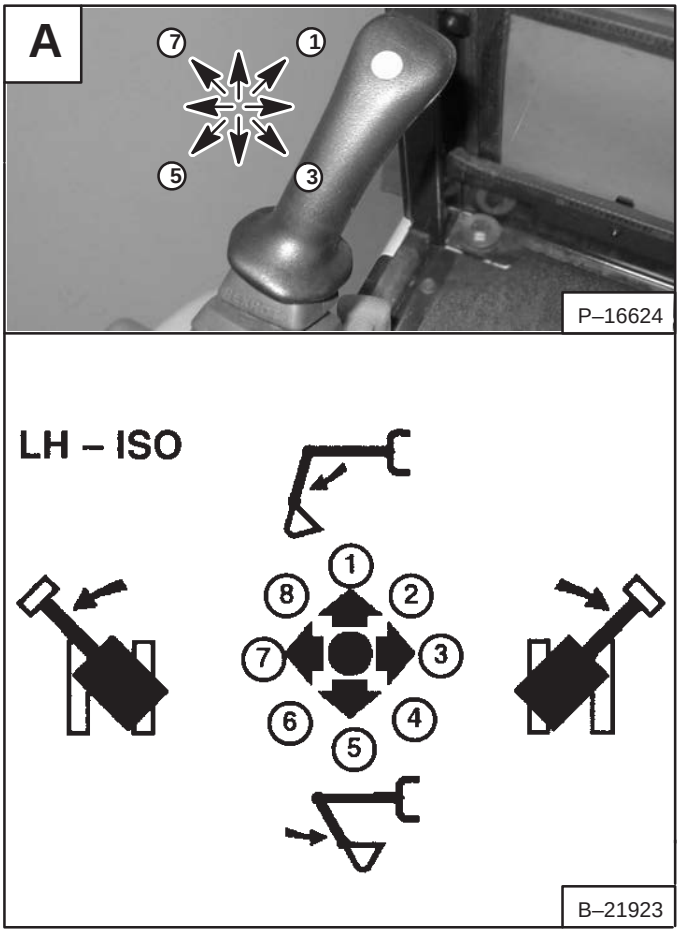
ISO Control Pattern

The work equipment (backhoe and upper structure swing) is operated by using the left and right control levers (joysticks) **[A]** & **[B]**.

Left Control Lever

The left lever is used to operate the arm and to swing the upperstructure **[A]**:

1. Arm out.
2. Arm out and slew right.
3. Slew right.
4. Arm in and slew right.
5. Arm in.
6. Arm in and slew left.
7. Slew left.
8. Arm out and slew left.



Right Control Lever

The right lever is used to operate the boom and bucket **[B]**.

1. Boom lower.
2. Boom lower and bucket dump.
3. Bucket dump.
4. Boom raise and bucket dump.
5. Boom raise.
6. Boom raise and bucket curl.
7. Bucket curl.
8. Boom lower and bucket curl.

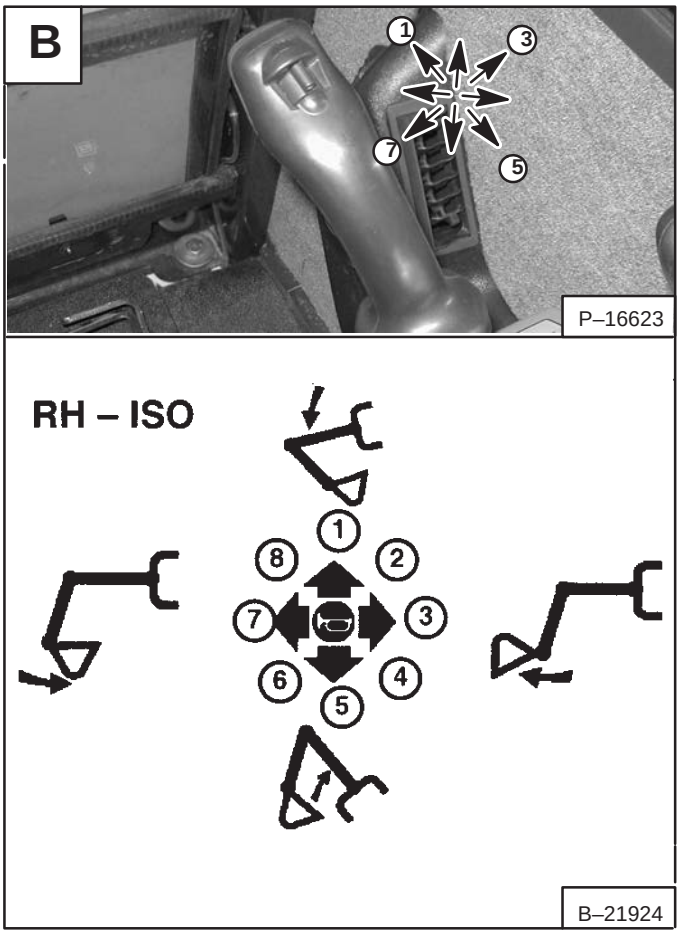
⚠ WARNING

AVOID INJURY OR DEATH

Before leaving the machine:

- **Lower the work equipment to the ground.**
- **Lower the blade to the ground.**
- **Stop the engine. Remove the key.**

W–2196–0595



HYDRAULIC CONTROLS (Cont'd)

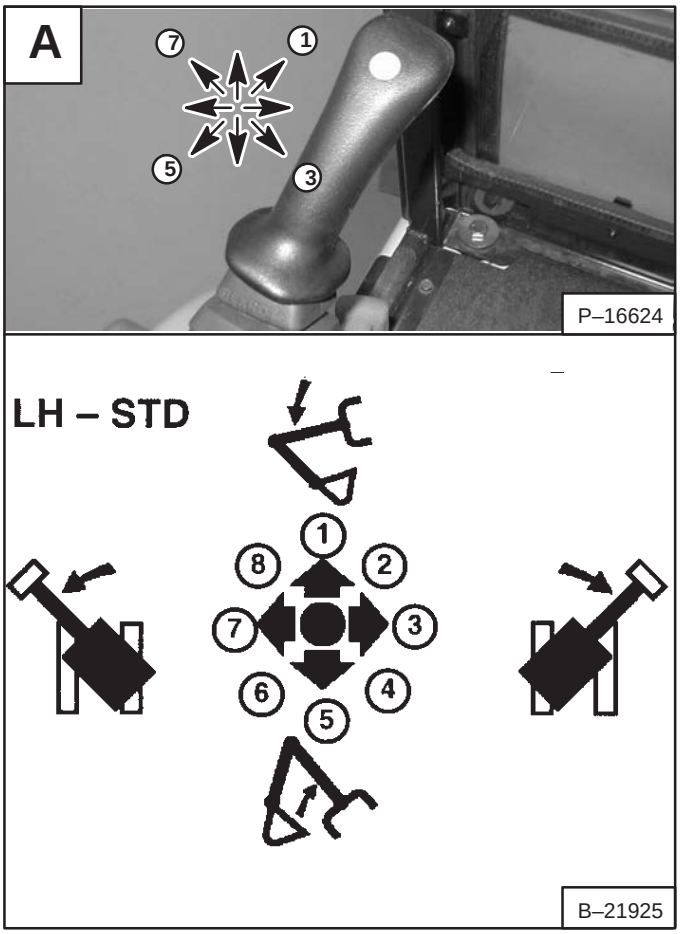
Standard Control Pattern

The work equipment (backhoe and upper structure swing) is operated by using the right and left control levers (joysticks) **[A]** & **[B]**.

Left Control Lever

The left lever is used to operate the boom and swing the upperstructure **[A]**:

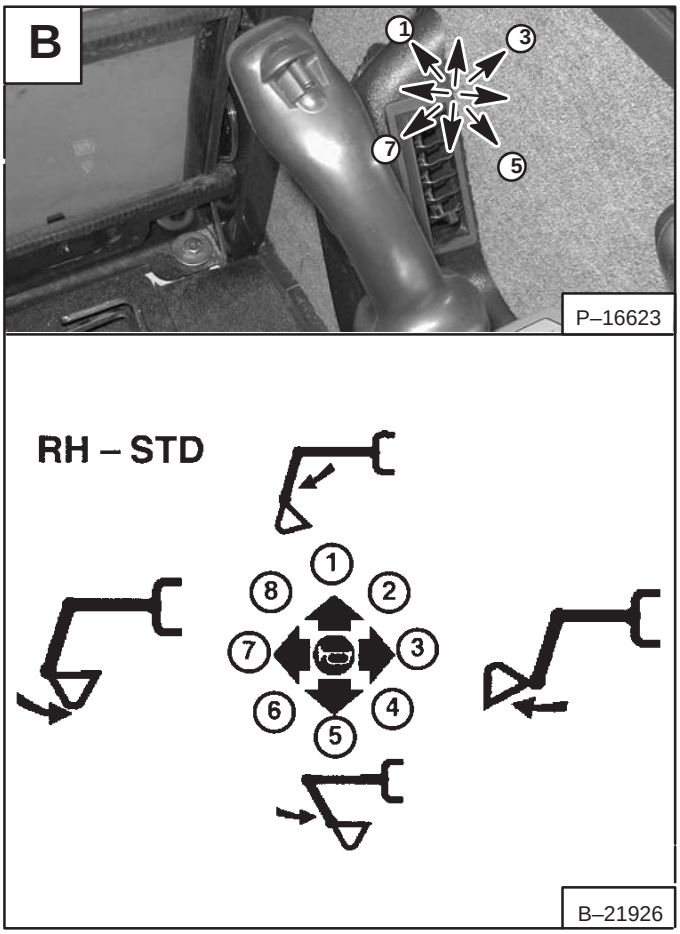
1. Boom Lower.
2. Boom Lower and Slew Right.
3. Slew Right.
4. Boom Raise and Slew Right.
5. Boom Raise.
6. Boom Raise and Slew Left.
7. Slew Left.
8. Boom Lower and Slew Left.



Right Control Lever

The right lever is used to operate the arm and bucket **[B]**:

1. Arm Out.
2. Arm Out and Bucket Dump.
3. Bucket Dump.
4. Arm In and Bucket Dump.
5. Arm In.
6. Arm In and Bucket Curl.
7. Bucket Curl.
8. Arm Out and Bucket Curl.



⚠ WARNING

AVOID INJURY OR DEATH

Before leaving the machine:

- **Lower the work equipment to the ground.**
- **Lower the blade to the ground.**
- **Stop the engine. Remove the key.**

W–2196–0595

HYDRAULIC CONTROLS (Cont'd)

Quick Couplers

Excavators and attachments have flush faced couplers (Item 1) **[A]**.

⚠ WARNING

AVOID BURNS

Hydraulic fluid, tubes, fittings and quick couplers can get hot when running machine and attachments. Be careful when connecting and disconnecting quick couplers.

W–2220–0396

To Connect:

Remove any dirt or debris from the surface of both the male and female couplers, and from the outside diameter of the male coupler. Visually check the couplers for corroding, cracking, damage, or excessive wear, if any of these conditions exist, the coupler(s) (Item 1) **[A]** must be replaced.

Install the male coupler into the female coupler. Full connection is made when the ball release sleeve slides forward on the female coupler.

To Disconnect:

Hold the male coupler. Retract the sleeve on the female coupler until the couplers disconnect.

NOTE: Some machines may have a locking sleeve on the female coupler. The pin and groove (Items 1 & 2) [B] must be aligned for the sleeve to move for connection and disconnection.

Auxiliary Hydraulics

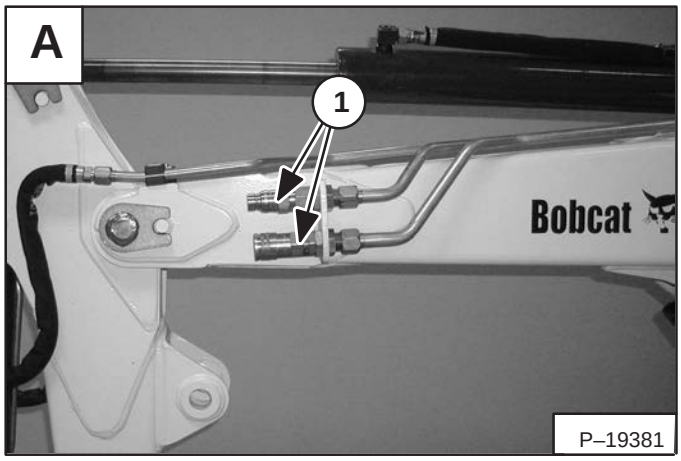
Press the Auxiliary Hydraulics button on the right console (Item 1) **[C]**.

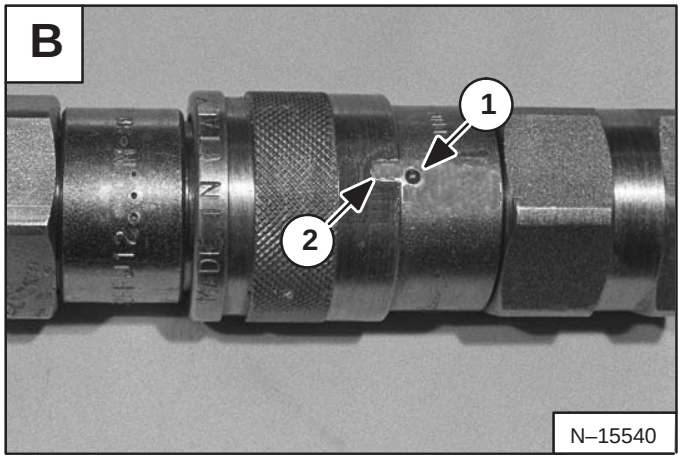
Move the switch (Item 2) **[C]** on the right control lever to the right or left to direct fluid flow to an attachment such as a breaker or hydraulic clamp.

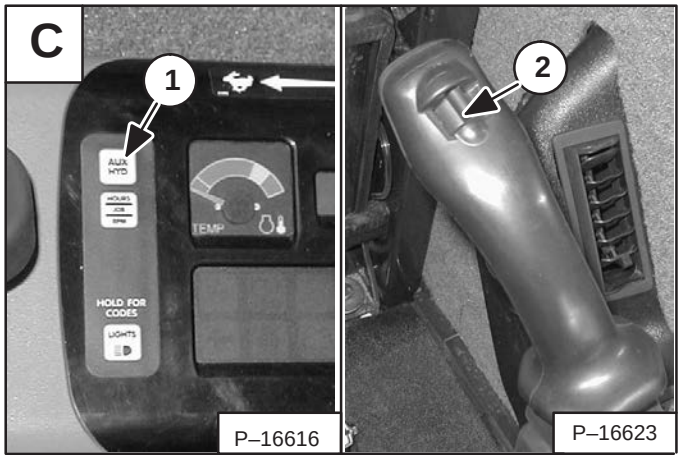
Relieving Hydraulic Pressure

Stop the engine and turn the key to RUN (Base) or press ENTER CODE Button (Keyless).

Press AUX HYD Button (Item 1) **[C]** and then move the switch (Item 2) **[C]** to the right and left several times.







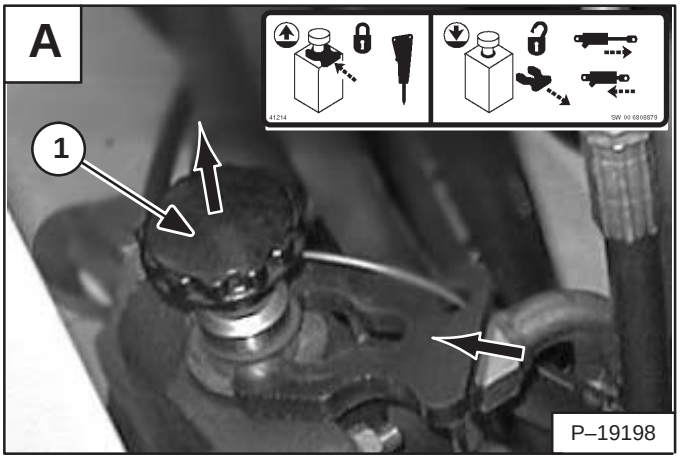
HYDRAULIC CONTROLS (Cont'd)

Two–Way Flow / One–Way Flow (Breaker Operation) (Field Accessory)

A flow control valve which allows for reduced back pressure necessary for breaker operation is available.

Pull the knob (Item 1) **[A]** up and install the stop on the spool to hold it in the engaged position (see decal) when using the hydraulic breaker.

Be sure to change again when not using the breaker attachment.

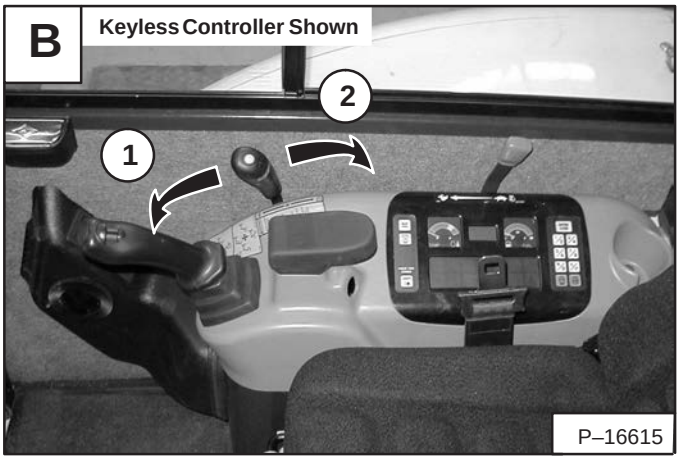


BLADE CONTROL LEVER

Push the lever forward to lower the blade (Item 1) **[B]**.

Pull the lever backward to raise the blade (Item 2) **[B]**.

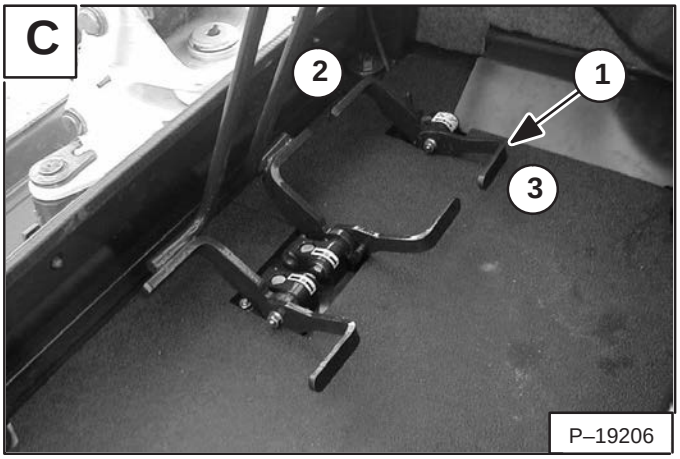
NOTE: Keep the blade lowered when digging to help stabilize machine.



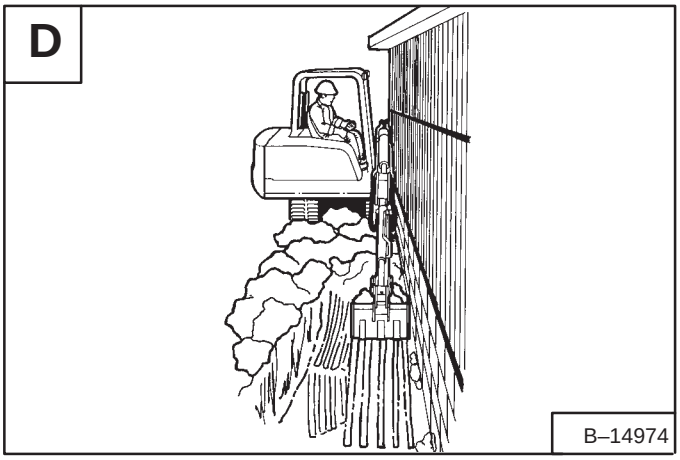
BOOM SWING PEDAL

Release the pedal lock and pivot the heel of the pedal to the rear (Item 1) **[C]**.

Push the toe of the pedal (Item 2) **[C]** to swing the boom to the right; push the heel of the pedal (Item 3) **[C]** to swing left.



NOTE: The purpose of the boom swing pedal is to offset the boom with respect to the upperstructure for digging close to a structure [D].



DAILY INSPECTION

Check the following items before each day of operation:

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The Service Schedule **[A]** is a guide for correct maintenance of the Bobcat Excavator. It is located inside the rear door of the excavator and also in the MACHINE SIGN TRANSLATION SECTION Page 63.

- Operator Canopy or Cab (ROPS/TOPS) and mounting hardware.
- Seat belt and mounting hardware.
- Damaged decals, replace as needed.
- Check control console lockout.
- Air cleaner and intake hoses.
- Engine oil level and for engine leaks.
- Hydraulic fluid level and system for leaks.
- Grease all pivot points.
- Cylinder and attachment pivot points.
- Track Tension.
- Repair broken and loose parts.

⚠ WARNING

Instructions are necessary before operating or servicing machine. Read Operation & Maintenance Manual, and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Failure to follow instructions can cause injury or death.

W–2144–1089

Fluids such as engine oil, hydraulic fluid, coolants, etc. must be disposed of in an environmentally safe manner. Some regulations require that certain spills and leaks on the ground must be cleaned in a specific manner. See local, state and federal regulations for correct disposal.

A

SERVICE SCHEDULE

• Service only when machine is equipped with this item.
■ Service at first 50 hours, then as scheduled.
▲ Service at first 100 hours, then as scheduled.

EVERY 8–10 HOURS
Check engine coolant level.
Check engine oil level.
Check hydraulic fluid level.
Check air cleaner condition indicator.
Check and adjust track tension.
Check indicator lights for correct operation.
Check canopy or *cab condition and mounting hardware.
Check seat belt condition and mounting hardware.
Check control console(s) lockout for proper operation.
Check for damaged signs (decals) - Replace as needed.
Grease all machinery pivot points. (See illustrations)
*Apply grease to slide on extendible arm.
*Clean cab heater filter.

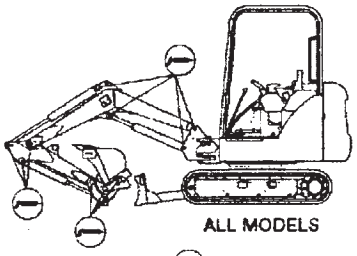
EVERY 50 HOURS
Grease swing pinion and swing circle. (See illustrations)
Drain water and sediment from fuel tank and fuel filter.
Check battery, cables and electrolyte level.

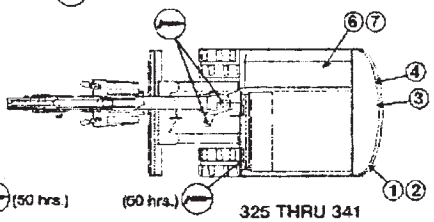
EVERY 100 HOURS
■ Check and adjust belt(s) if required.
Spark Arrestor Muffler - Clean spark chamber.
Replace engine oil and filter. (Model 320 and 322 only)

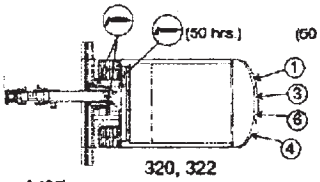
EVERY 250 HOURS
Replace diesel fuel filter.
Replace inline diesel fuel filter. (Models 430 and 435 only)
■ Replace engine oil and filter. (All models except 320, 322, 430 and 435)
Check oil level in both final drive cases. (All models except 430 and 435)

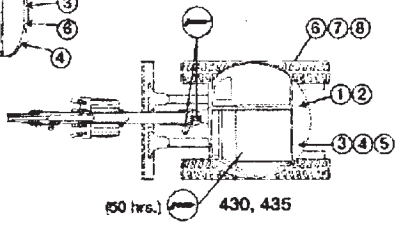
EVERY 500 HOURS
Clean radiator, oil cooler and *A/C condenser.
■ Replace engine oil and filter. (Models 430 and 435 only)
▲ Replace primary hydraulic filter.
▲ Replace case drain hydraulic filter. (All models except 320 and 322)
▲ Replace fan hydraulic filter. (Models 430 and 435 only)
Check alternator and starter connections.
Check and adjust engine valve clearance.
Replace air cleaner element. (Models 320 and 322 only)

EVERY 1000 HOURS OR EVERY 6 MONTHS
▲ Replace oil in both final drive cases. (All models except 430 and 435).
Drain and flush cooling system - Replace coolant.
Replace hydraulic fluid and filter(s) - Clean reservoir.









IMPORTANT

THIS MACHINE IS FACTORY EQUIPPED WITH A U.S.D.A. FORESTRY SERVICE APPROVED SPARK ARRESTOR MUFFLER.

IT IS NECESSARY TO CLEAN THIS SPARK ARRESTOR MUFFLER TO KEEP IT IN WORKING CONDITION. THE SPARK ARRESTOR MUFFLER MUST BE SERVICED BY DUMPING THE SPARK CHAMBER EVERY 100 HOURS OF OPERATION.

IF THIS MACHINE IS OPERATED ON FLAMMABLE FOREST, BRUSH OR GRASS COVERED LAND, IT MUST BE EQUIPPED WITH A SPARK ARRESTOR ATTACHED TO THE EXHAUST SYSTEM AND MAINTAINED IN WORKING ORDER. FAILURE TO DO SO WILL BE IN VIOLATION OF CALIFORNIA STATE LAW, SECTION 4442 PRC.

REFER TO LOCAL LAWS AND REGULATIONS FOR SPARK ARRESTOR REQUIREMENTS.

FILTER CHART

		320, 322	325, 328	331, 334 331E	337, 341	430	435
1.	PRIMARY AIR FILTER	6673752	6672467	6666333	6666375	6666333	6666375
2.	SECONDARY AIR FILTER	6673753	6672468	6666334	6666376	6666334	6666376
3.	ENGINE OIL FILTER	3974113B	6675517	6675517	6675517	6675517	6675517
4.	FUEL FILTER	6667352	6667352	6667352	6667352	6667352	6667352
5.	INLINE FUEL FILTER	N/A	N/A	N/A	N/A	6633977	6633977
6.	PRIMARY HYDRAULIC FILTER	6653336	6661248	6661248	6670207	6661248	6661248
7.	DRAIN HYDRAULIC FILTER	N/A	6516722	6516722	6516722	6681012	6681012
8.	FAN HYDRAULIC FILTER	N/A	N/A	N/A	N/A	6681012	6681012

• See illustrations above for filter locations.

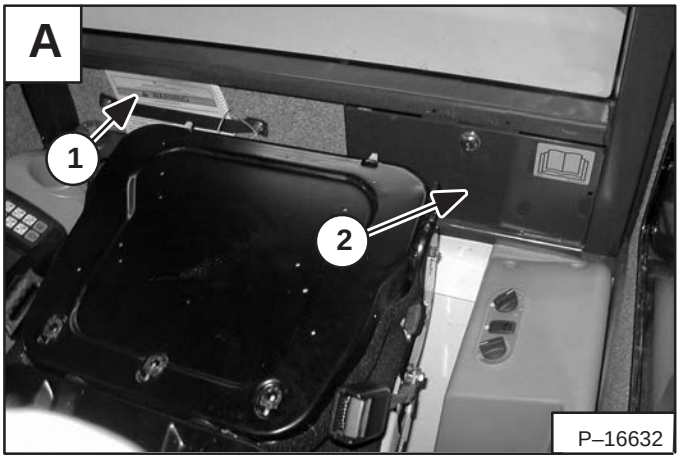
43504 • *See Operation & Maintenance Manual for more information and instructions.* 8W 02 6815092

6815092

PRE–STARTING PROCEDURE

Read and understand the Operation & Maintenance Manual and the Operator's Handbook (Item 1) **[A]** before operating.

The Operation & Maintenance Manual and other manuals can be kept in a container (Item 2) **[A]** provided behind the operator's seat.



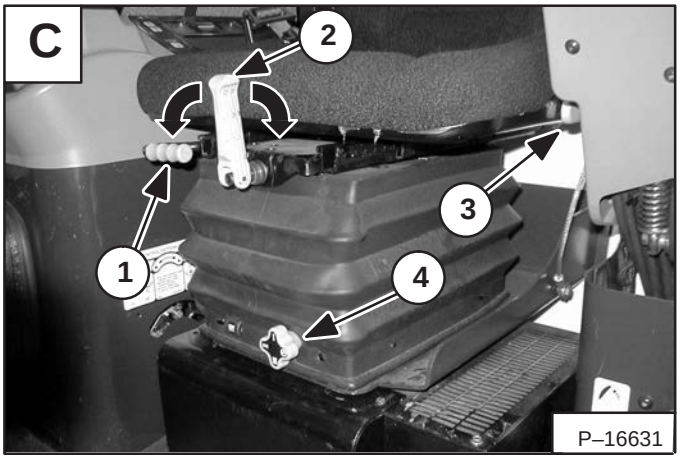
Use the grab handles, the tracks and the safety treads to enter the canopy/cab **[B]**.

Release the seat lever (Item 1) **[C]** to adjust the seat forward or backward.

Turn the handle (Item 2) **[C]** to change the adjustment for operator weight.

Release the lever (Item 3) **[C]** to change the incline of the seat back.

Sit in the seat and turn the knob (Item 4) **[C]** to adjust the height of the seat. (Zero (O) adjustment is the lowest; III is highest.)



Fasten the seat belt **[A]**.

Lower the control console **[B]**.

NOTE: There is a control lock switch in the left console which deactivates the hydraulic control levers (joysticks) and the traction drive system when the control console is raised. The console must be in the locked down position for the hydraulic control levers (joysticks) and traction system to operate.

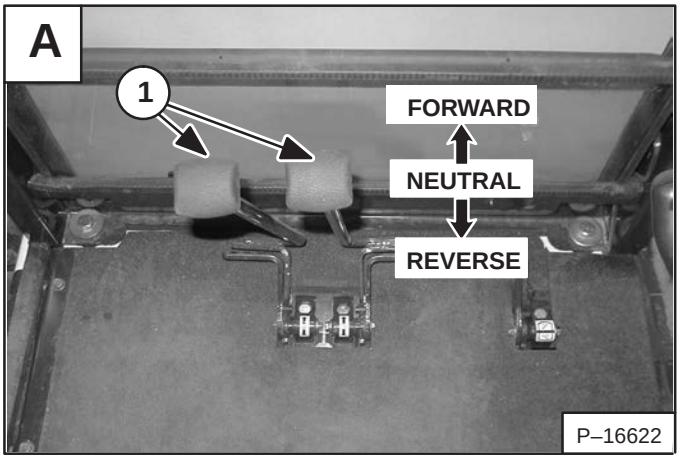
NOTE: If the control lock switch does not deactivate the control levers and traction system when console is raised, see your Bobcat dealer for service.

STARTING THE ENGINE

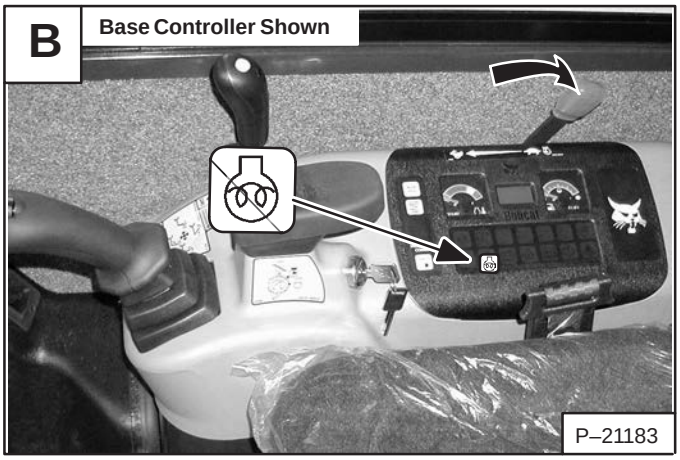
Key Switch (Base Controller)

Perform the *PRE–STARTING PROCEDURE* Page 16.

Put control levers (Item 1) **[A]** in the neutral position.



Move the engine speed control to low idle **[B]**.

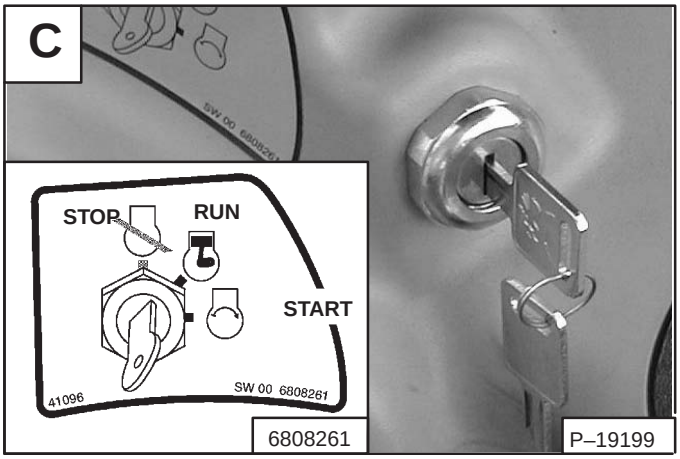


Turn the key to START **[C]**. If preheating is required, the glow plugs will automatically cycle and the remaining preheat time (in seconds) will show in the LCD. (Preheat Icon will be ON **[B]**.

Release the key when the engine starts. It will return to the RUN position.

Stop the engine if the warning lights and alarm do not go OFF. Check for the cause before starting the engine again.

Turn the key switch OFF to stop the engine.



IMPORTANT

Do not engage the starter for longer than 15 seconds at a time. Longer use can damage the starter by overheating. Allow starter to cool for one minute before using starter again.

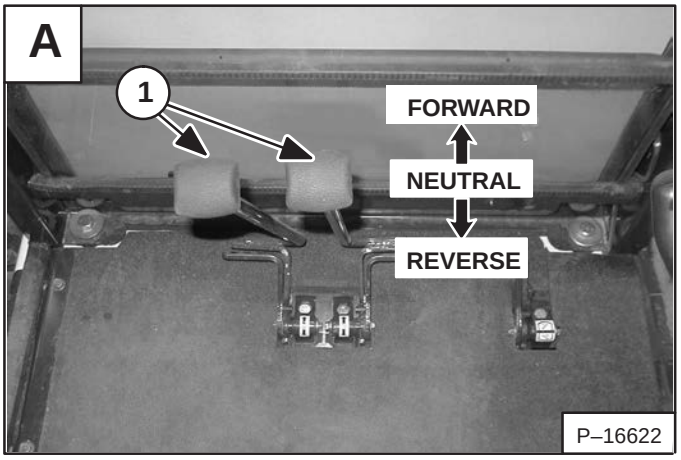
I–2034–0700

STARTING THE ENGINE

Keyless Start (Keyless Controller)

Perform the *PRE–STARTING PROCEDURE* Page 16.

Put control levers (Item 1) **[A]** in the neutral position.

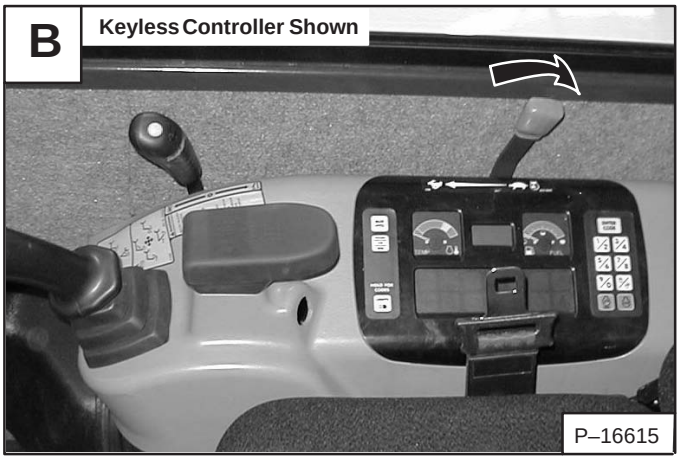


Move the engine speed control to low idle **[B]**.

Press ENTER CODE Button (Item 1) **[C]**. The display will become lighted and there will be two short beeps. **CodE** will appear on the LCD.

Use the keypad (Item 2) **[C]** to enter the password. For each digit that you enter, a dash will appear on the LCD. (You have 40 seconds to enter the password or the process will abort and you will need to start over.) If the password was entered correctly, there will be one long beep.

NOTE: If the password was incorrect there will be three short beeps and "Error" will appear on the LCD. Press the ENTER CODE Button again and start over. After three failed attempts, you must wait three minutes to try again.

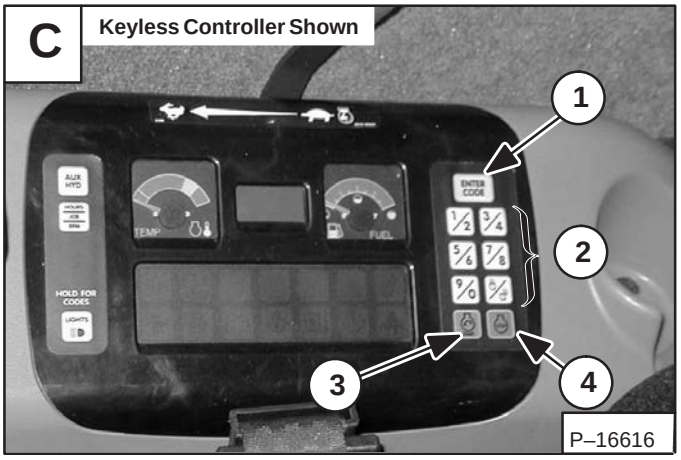


Press the START Button (Item 3) **[C]** and hold it until the engine starts.

IMPORTANT

Do not engage the starter for longer than 15 seconds at a time. Longer use can damage the starter by overheating. Allow starter to cool for one minute before using starter again.

I–2034–0700



Press the STOP Button (Item 4) **[C]** to stop the engine.

Password Lockout Feature

See *SYSTEM SETUP AND ANALYSIS*, Page 57 for Password Lockout Feature.

⚠ WARNING

AVOID INJURY OR DEATH

When an engine is running in an enclosed area, fresh air must be added to avoid concentration of exhaust fumes. If the engine is stationary, vent the exhaust outside. Exhaust fumes contain odorless, invisible gases which can kill without warning.

W–2050–1285

- **Engines can have hot parts and hot exhaust gas. Keep flammable material away.**
- **Do not use machines in atmosphere containing explosive gas.**

W–2051–1086

Cold Temperature Starting Procedure

If the temperature is below freezing, perform the following to make starting the engine easier:

- Replace the engine oil with the correct type and viscosity for the anticipated starting temperature. (See *FUEL, COOLANT AND LUBRICANTS*, Page 81.)
- Make sure the battery is fully charged.
- Install an engine heater.

NOTE: If the battery is discharged (but not frozen) a booster battery can be used to jump start the excavator. (See *Using A Booster Battery* Page 44.)

Push the speed control lever fully forward **[A]**.

Key Switch (Base Controller)

Turn the key to RUN **[B]**. If the preheat icon **[B]** comes ON, wait for it to go off then turn the key to START **[B]**.

Release the key when the engine starts. It will return to the RUN position.

Stop the engine if the warning lights and alarm do not go OFF. Check for the cause before starting the engine again.

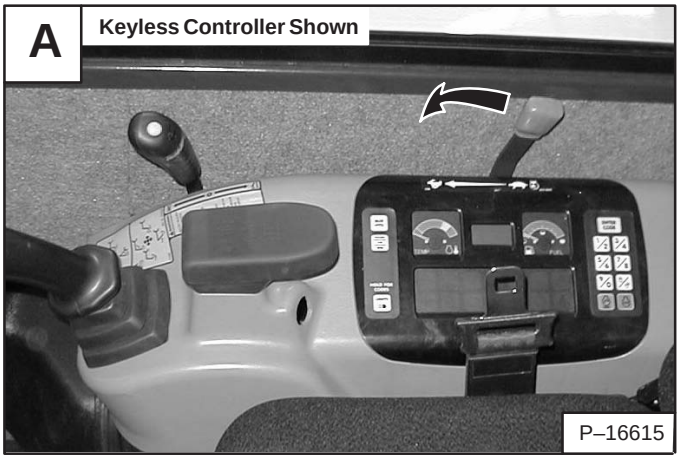
When the engine speed increases, move the speed control lever to idle position until the engine warms.

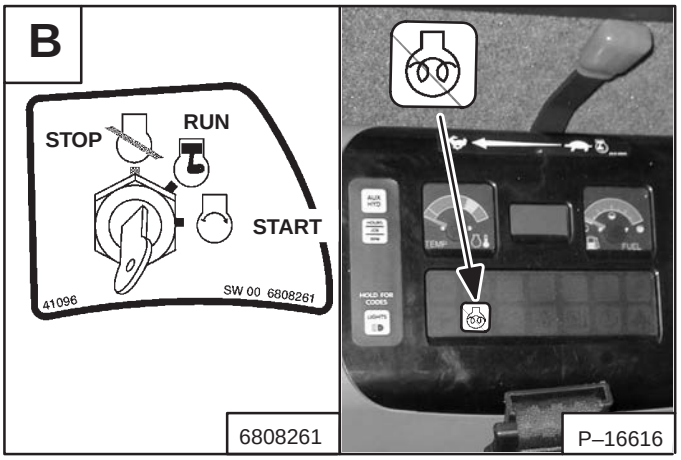
Keyless Start (Keyless Controller Only)

Follow STARTING PROCEDURE (Keyless Start) Page 19.

If the preheat icon **[B]** comes ON, wait for it to go off before pressing the START Button.

The remaining preheat time (in seconds) will count down in the LCD.





IMPORTANT

Do not engage the starter for longer than 15 seconds at a time. Longer use can damage the starter by overheating. Allow starter to cool for one minute before using starter again.

I–2034–0700

Machines warmed up with moderate engine speed and light load have longer life.

I–2015–0284

⚠ WARNING

Do not use ether with glow plug (preheat) systems. Explosion can result which can cause injury or death, or severe engine damage.

W–2071–0700

ATTACHMENTS (Using the X–Change™ System)

Removing Bucket or Attachment

The excavator is equipped with the X–Change™ system. The X–Change™ is used for fast changing of buckets and attachments.

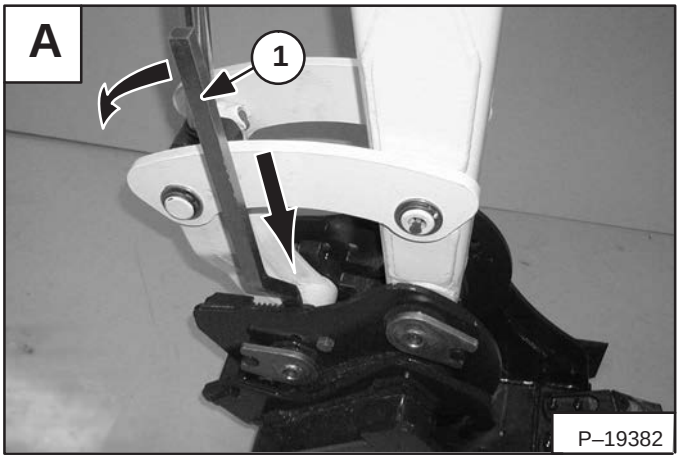
NOTE: Removal and Installation of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

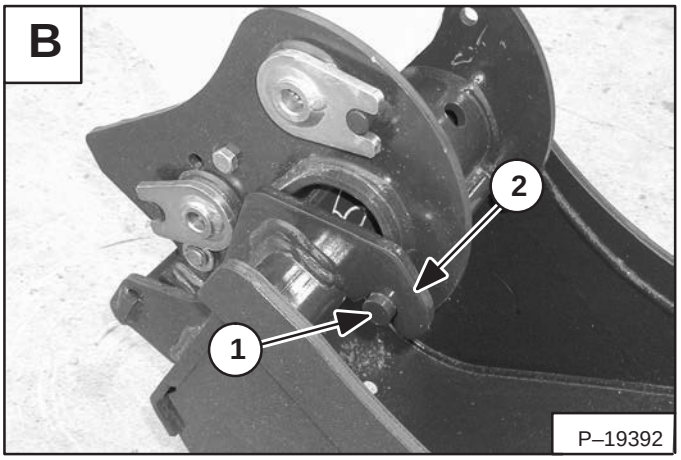
Stop the machine on a flat level surface. Put the bucket on the ground.

Install the X–Change™ tool (Item 1) **[A]** in the latch. (The tool is stored in the tailgate.)

Pull the tool (Item 1) **[A]** to unlock the latch. Remove the tool.

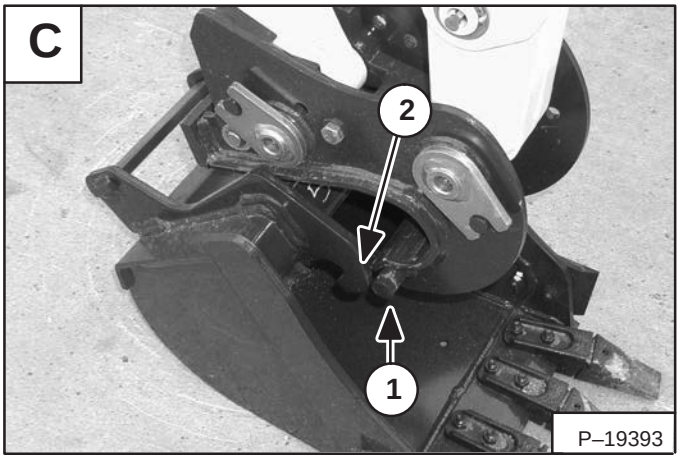
Start the engine, lift the boom approximately one foot, and extend the bucket cylinder until the X–Change™ pins (Item 1) **[B]** engage the hooks (Item 2) **[B]** on the bucket.





Retract the bucket cylinder and lower the boom and arm until the bucket is on the ground, and the X–Change™ pins (Item 1) **[C]** are disengaged from the hooks (Item 2) **[C]**.

Move the arm toward the machine until the X–Change™ pins are clear of the bucket.



ATTACHMENTS (Using the X–Change™ System) (Cont'd)

Installing Bucket or Attachment

⚠ WARNING

Never use attachments or buckets which are not approved by Bobcat. Buckets and attachments for safe loads of specified densities are approved for each model. Unapproved attachments can cause injury or death.

W–2052–0100

Fully retract the bucket cylinder to release the latch on the X–Change™ **[A]**.

Move the arm toward the bucket.

Raise the boom until the pins (Item 1) **[B]** engage the hooks (Item 2) **[B]** on the bucket.

Lift the boom and extend the bucket cylinder until the bucket is in the position shown **[C]**.

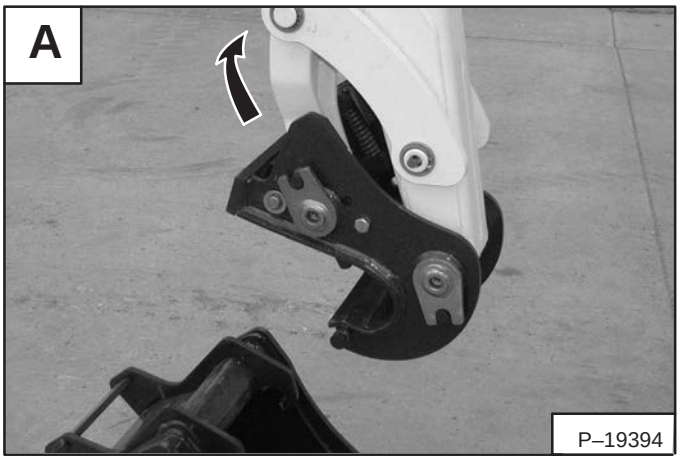
Lower the boom until the hooks (Item 1) **[D]** of the bucket disengage the pins (Item 2) **[D]** of the X–Change™ and the plate (Item 3) **[D]** engages in the bucket crossmember.

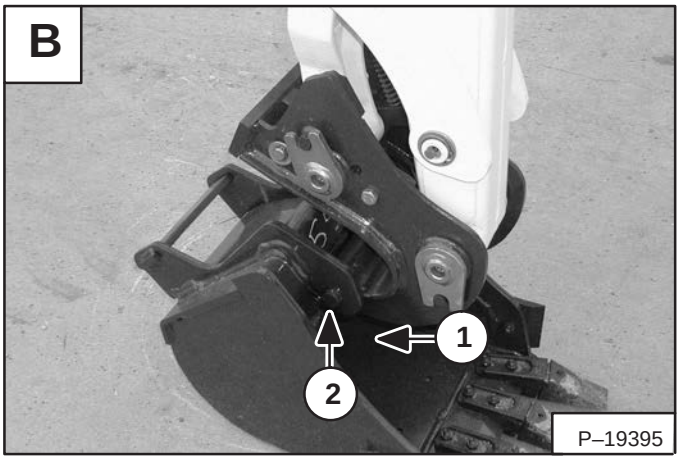
⚠ WARNING

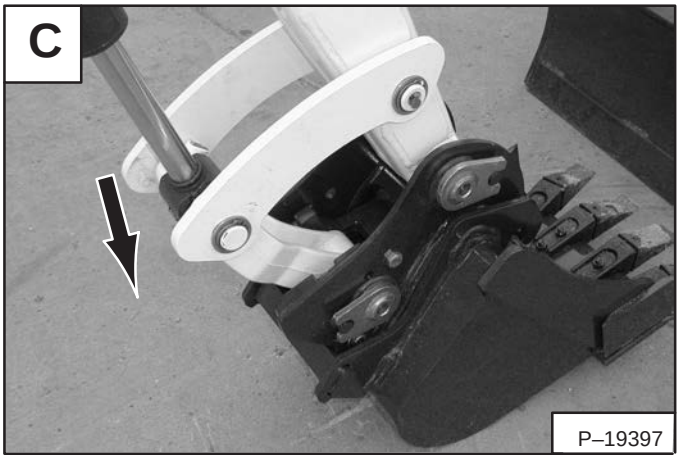
Keep all bystanders 20 feet (6 m) away from equipment when operating. Contact with moving parts, a trench cave–in or flying objects can cause injury or death.

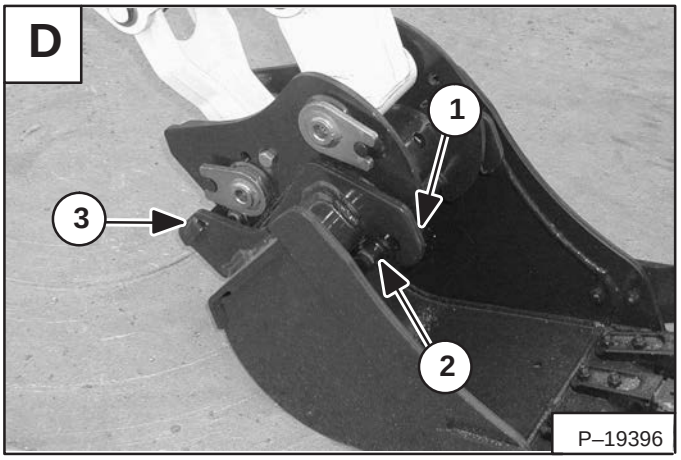
W–2119–0788

After the installation of the bucket, lift the boom approximately three feet and fully extend and retract the bucket cylinder to ensure the bucket is securely attached to the X–Change™.









OPERATING PROCEDURE

Operating On Public Roads

When operating on a public road or highway, always follow local regulations. For example: A slow moving vehicle (SMV) sign, or direction signals may be required.

Check with utility companies for underground electrical, water, gas lines, etc. Work slowly in areas of underground utilities.

⚠ WARNING

AVOID INJURY OR DEATH

Do not exceed rated operating capacity. Excessive load can cause tipping or loss of control.

W–2053–0887

Lifting A Load

Do not exceed the rated load capacity. (See *MACHINE SIGNS & TRANSLATIONS – Lifting Decal*, Page 63.)

Extend the bucket cylinder completely and lower the boom to the ground. Stop the engine.

Wrap the chain assembly around the bucket mounting plate.

Make sure the load is evenly weighted and centered on the lifting chain, and is secured to prevent the load from shifting **[A]**.

Lift and position the load. When the load is in position and tension is removed from the lift chain (secondary lift system), remove the secondary lift system.

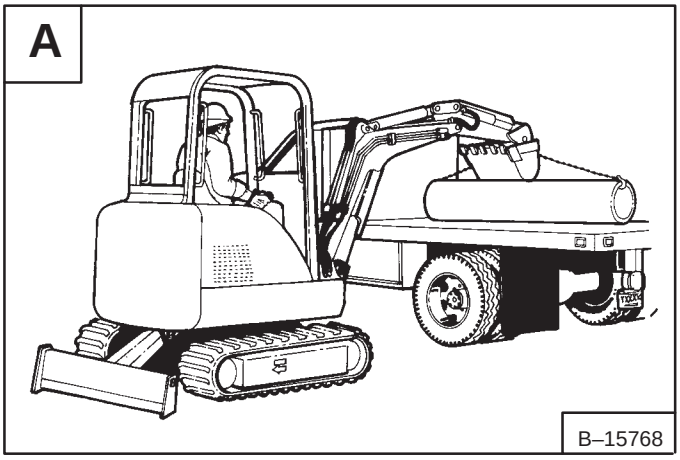
The optional lifting clamp attachment gives the excavator a wider range of use and mobility for debris removal **[B]**.

The lifting clamp is operated by the auxiliary hydraulic system.

The lifting clamp cylinder must be fully retracted when the machine is being used for excavating.

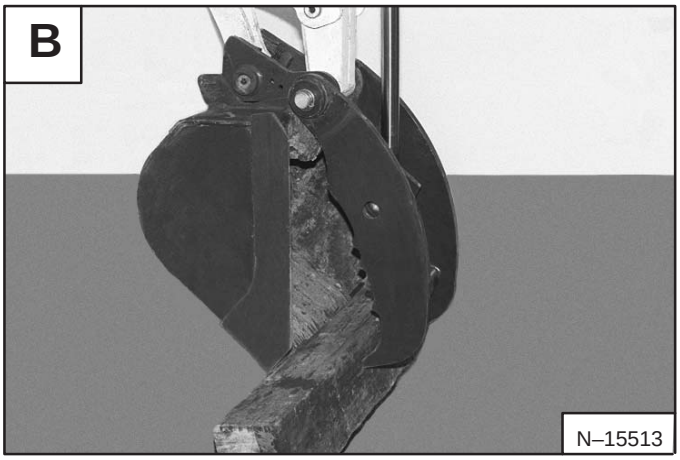
The lift capacities are reduced by 270 lbs. (122 kg) if the excavator is equipped with the optional lifting clamp.

A



B–15768

B



N–15513

⚠ WARNING

AVOID INJURY OR DEATH

Check area to be dug for overhead or underground lines such as electrical, gas, oil, water, etc. Consult local utilities before digging. Extreme caution must be used in areas where lines are present.

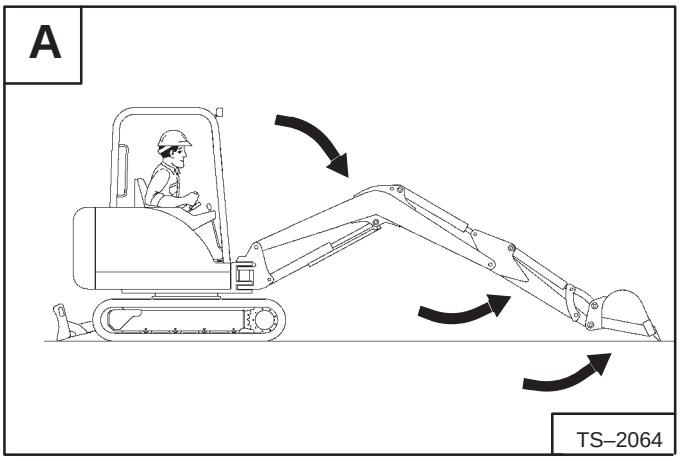
W–2116–0788

OPERATING PROCEDURE (Cont'd)

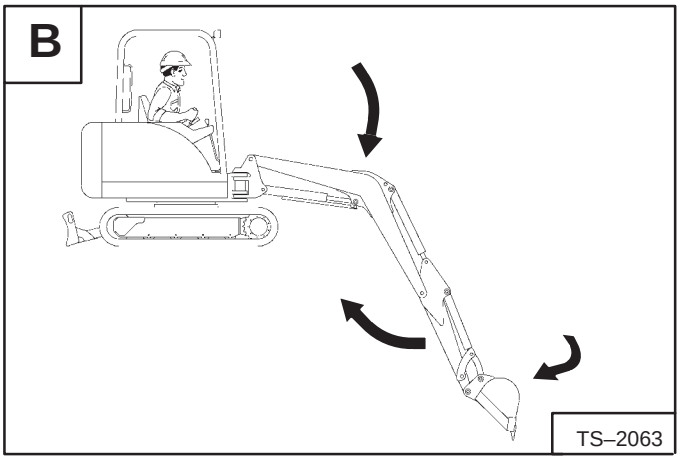
Excavating

Lower the blade to provide stability.

Extend the arm, lower the boom and open the bucket **[A]**.



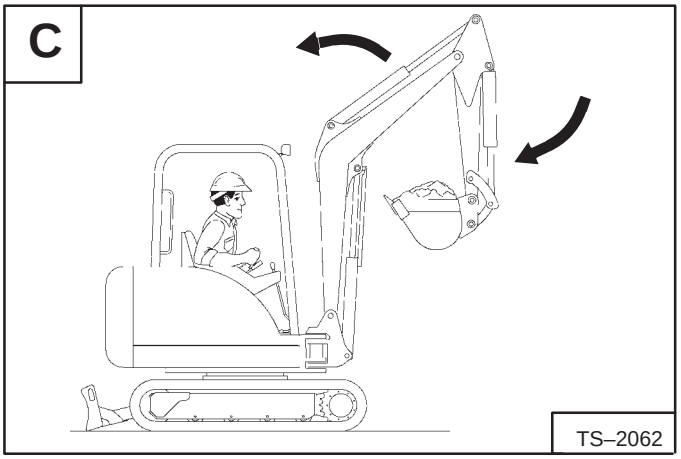
Retract the arm, while lowering boom and curling the bucket **[B]**.



Raise the boom, retract the arm and curl the bucket **[C]**.

Rotate the upperstructure.

NOTE: Do not allow the bucket teeth to contact the ground when swinging the upperstructure.

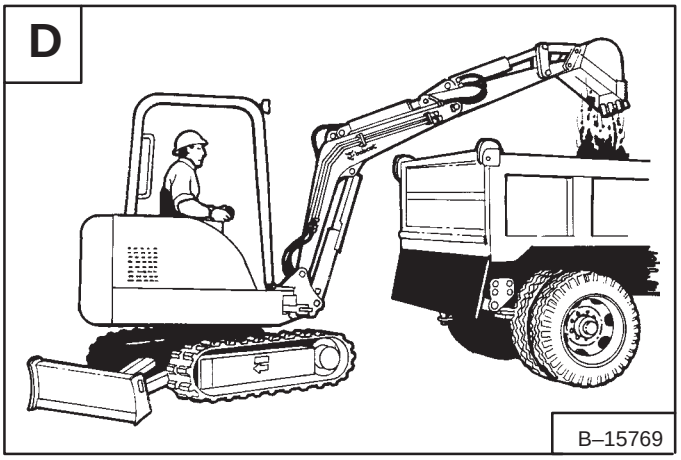


⚠ WARNING

Keep all bystanders 20 feet (6 m) away from equipment when operating. Contact with moving parts, a trench cave–in or flying objects can cause injury or death.

W–2119–0788

Extend the arm and uncurl the bucket to dump the material into a pile or truck **[D]**.



IMPORTANT

Avoid operating hydraulics over relief pressure. Failure to do so will overheat hydraulic components.

I–2220–0503

OPERATING PROCEDURE (Cont'd)

Excavating (Cont'd)

Do not dig under the excavator **[A]**.

Do not use the bucket as a breaker or pile driver. It is better to excavate hard or rocky ground after breaking it with other equipment. This will reduce damage to the excavator.

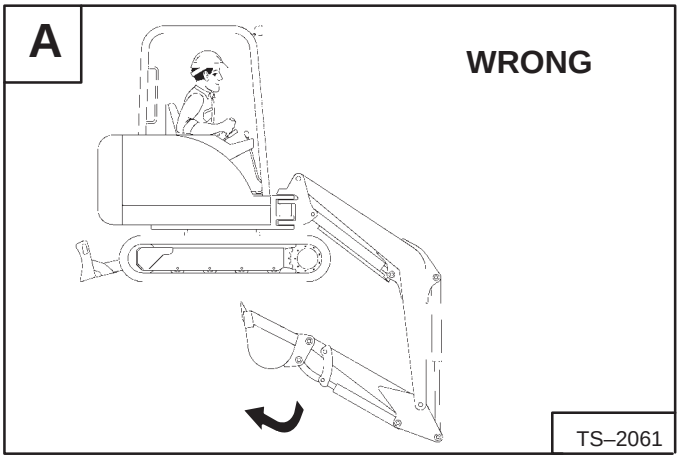
Do not move the excavator while the bucket is in the ground.

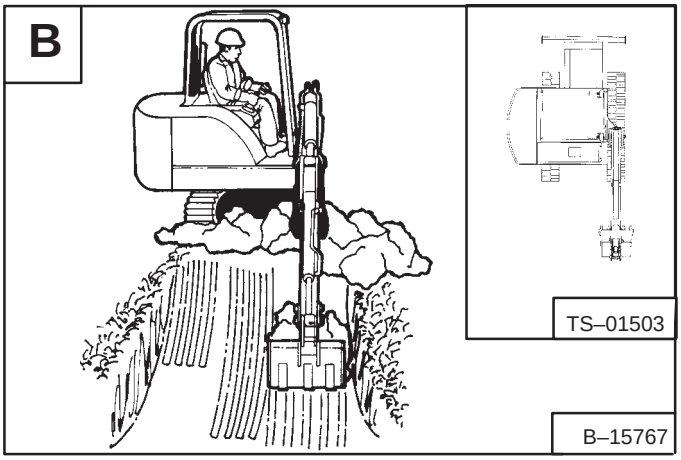
Dig only by moving the boom and arm toward the excavator.

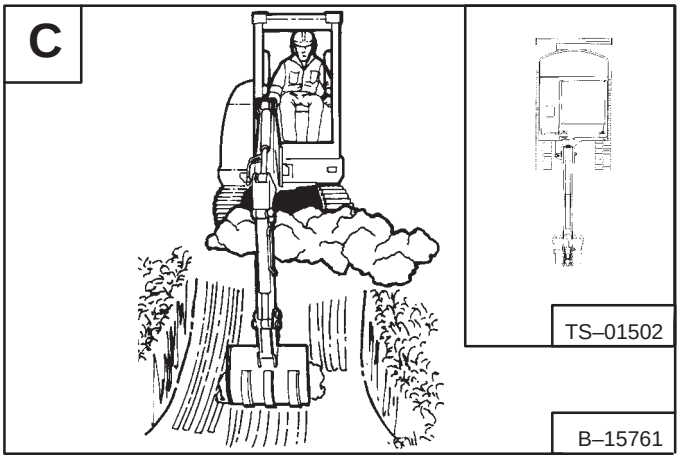
Do not back dig (digging by moving the boom and arm away from the excavator). Damage to the X–Change and attachments may occur.

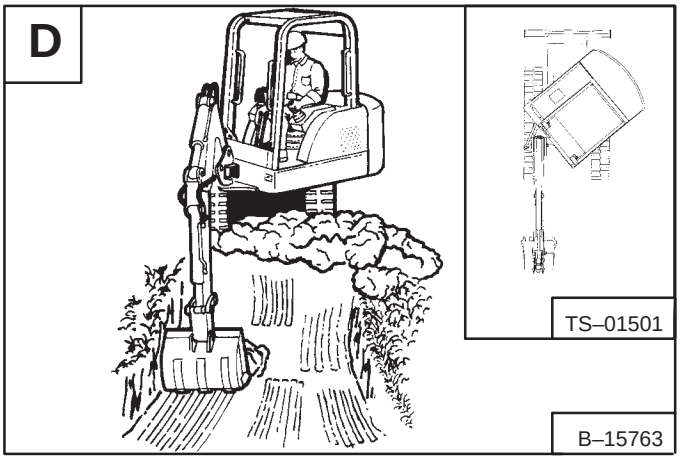
Boom Offset

Swing the upperstructure, offset the boom to the right **[B]**, center **[C]**, and left **[D]** to dig a square hole the width of the machine without repositioning the excavator.





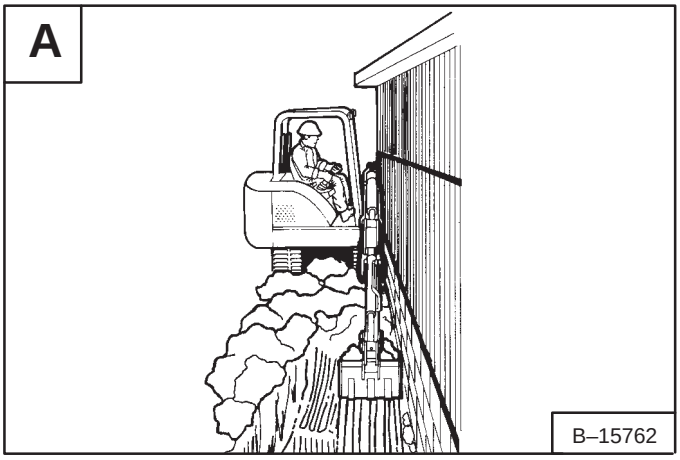




OPERATING PROCEDURE (Cont'd)

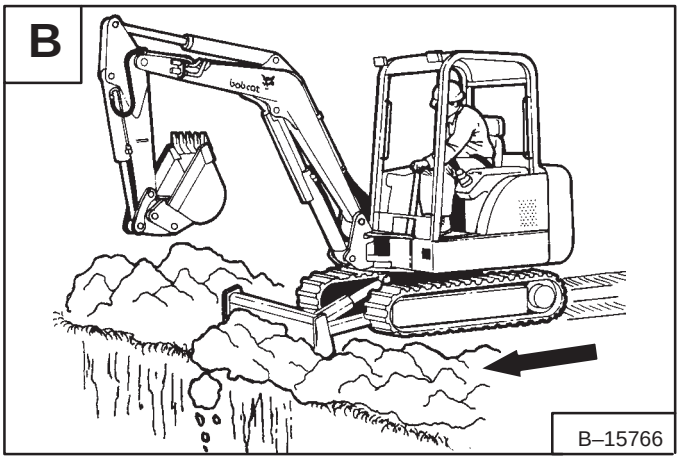
Boom Offset (Cont'd)

The boom offset allows the operator to dig close to buildings and other structures **[A]**.



Backfilling

Use the blade to backfill the trench or hole after excavating **[B]**.



Driving The Excavator

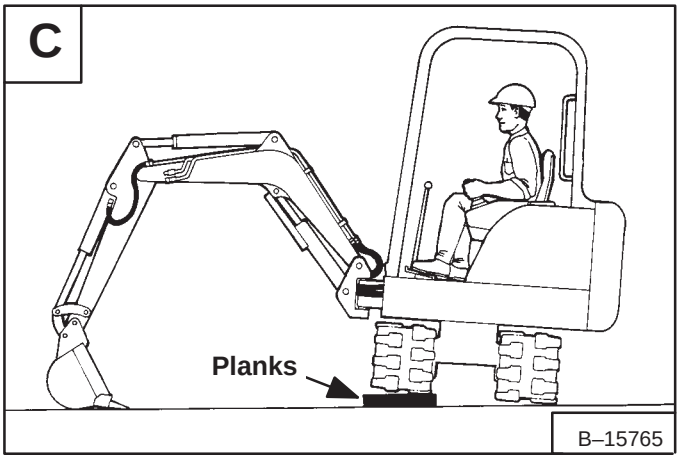
When operating on uneven ground, operate as slow as possible and avoid sudden changes in direction.

Avoid traveling over objects such as rocks, trees, stumps, etc.

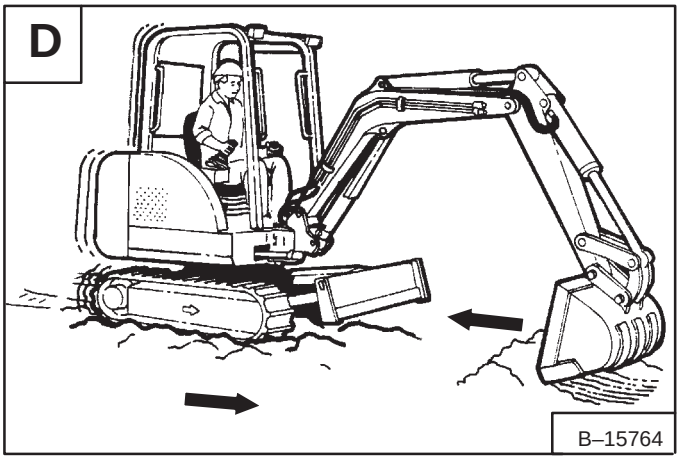
When working on wet or soft ground, put planks on the ground to provide a solid base to travel on and prevent the excavator from getting stuck.

If one or both tracks have become stuck in soft or wet ground, raise one track at a time by turning the upperstructure and pushing the bucket against the ground **[C]**.

Put planks under the tracks and drive the excavator to dry ground.



The bucket may also be used to *pull* the excavator. Raise the blade, extend the arm and lower the boom. Operate the boom and arm in a digging manner **[D]**.



Operating On Slopes

When going down a slope, control the speed with the steering levers and the speed control lever.

When going down grades that exceed 15 degrees, put the machine in the position shown, and run the engine slowly **[A]**.

Operate as slow as possible and avoid sudden changes in lever direction.

Avoid traveling over objects such as rocks, trees, stumps, etc.

Stop the machine before moving the upper equipment controls. Never allow the blade to strike a solid object. Damage to the blade or hydraulic cylinder can result.

When traveling up slopes or on side slopes that are 15 degrees or less, position the machine as shown and run the engine slow **[B]**.

⚠ WARNING

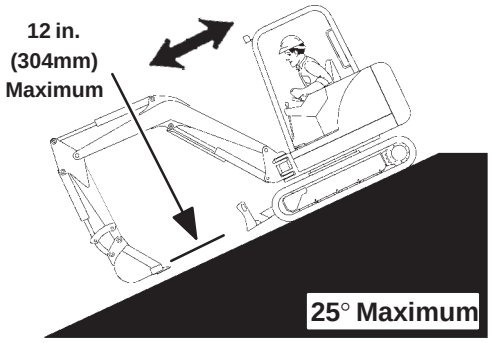
AVOID INJURY OR DEATH

- **Do not travel across or up slopes which are over 15 degrees to the side, or to the back of machine or 25 degrees to the front. Keep boom centered while traveling.**
- **Keep attachments as low as possible when traveling on slopes or in rough conditions.**

W–2199–0595

A

TRAVELING DOWN OR BACKING UP SLOPES



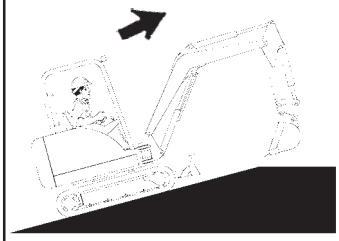
TS–2068

B

TRAVELING ON SIDE SLOPES

15° Maximum

TRAVELING UP SLOPES



15° Maximum

TS–2067

⚠ WARNING

AVOID INJURY OR DEATH

- **Fasten seat belt, start and operate only from the operator seat.**
- **Never wear loose clothing when working near machine.**

W–2135–1188

OPERATING PROCEDURE (Cont'd)

Operating On Slopes (Cont'd)

When operating on a slope, level a work area **[A]** before beginning.

If this is not possible, the following procedures should be used:

Do not work on slopes which are over 15 degrees.

Use a slow work cycle.

Avoid working with the tracks across the slope. This will reduce stability and increase the tendency for the machine to slide. Position the excavator with the blade downhill and lowered.

Avoid swinging or extending the bucket more than necessary in a down hill direction. When you must swing the bucket downhill, keep the arm low and skid the bucket downhill.

When working with the bucket on the uphill side, keep the bucket as close to the ground as possible. Dump the spoil far enough away from the trench or hole to prevent the possibility of a cave in.

To brake the machine when going down a slope, move the steering levers (Item 1) **[B]** to the *NEUTRAL* position. This will engage the hydrostatic braking.

When the engine stops on a slope, move the steering levers to the neutral position. Lower the boom/bucket to the ground.

NOTE: If the engine stops, the boom/bucket (attachments) can be lowered to the ground using hydraulic pressure which is stored in the accumulator.

The console must be in the locked down position, and the key switch in the ON position.

Use the control lever to lower the boom.

Start the engine and resume operation.

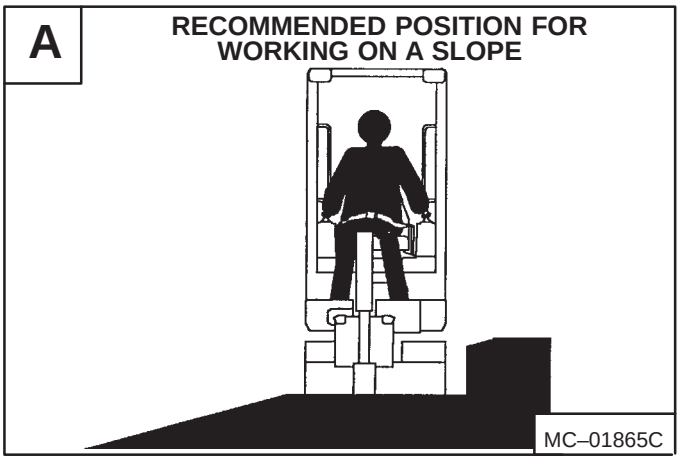
Operating In Water

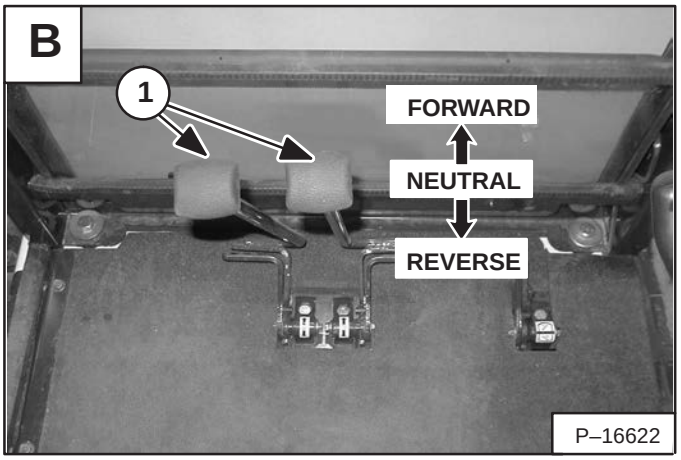
Mud and water should be removed from the machine before parking. In freezing temperatures, park the machine on boards or concrete to prevent the track or undercarriage from freezing to the ground and preventing machine movement.

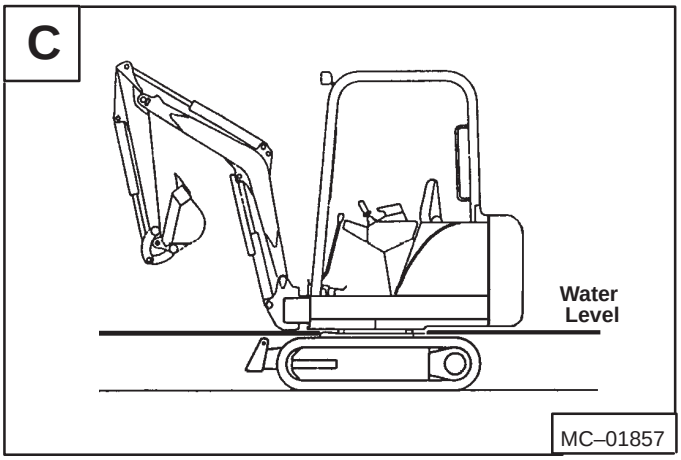
Do not operate or immerse the Excavator in water higher than the bottom of the swing circle **[C]**.

Grease the Excavator when it has been operated or immersed in water for a period of time. Greasing forces the water out of the lubrication areas.

Water must be removed from the cylinder rods. If water freezes to the cylinder rod, the cylinder seals can be damaged when the rod is retracted.







OPERATING PROCEDURES (Cont'd)

Extending The Arm (331E Only)

The arm can be extended to increase the reach of the excavator.

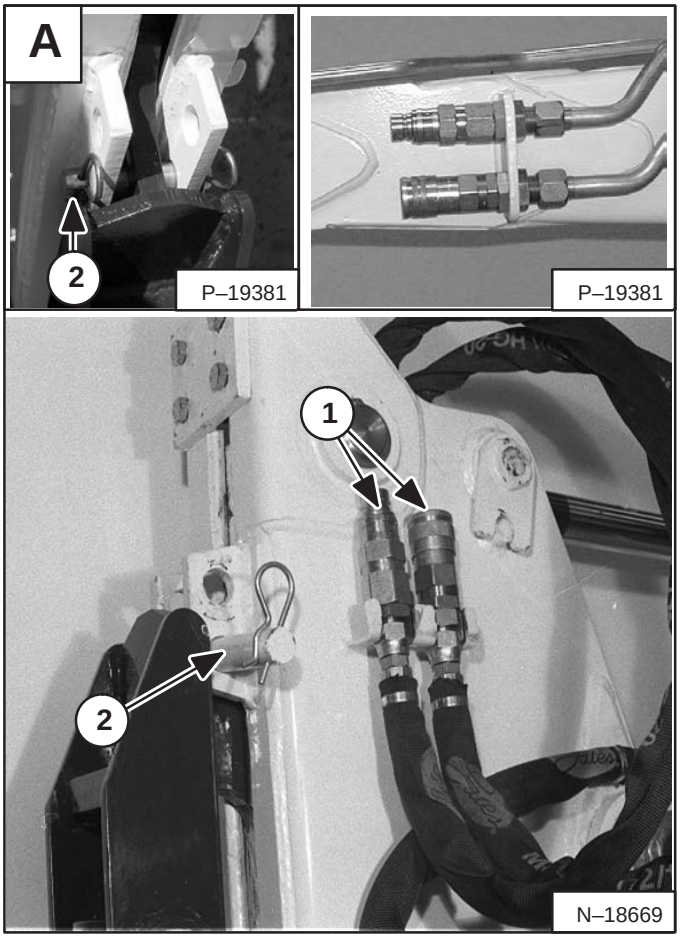
Remove quick couplers from the storage position (Item 1) **[A]** and connect to the auxiliary couplers (Inset) **[A]**.

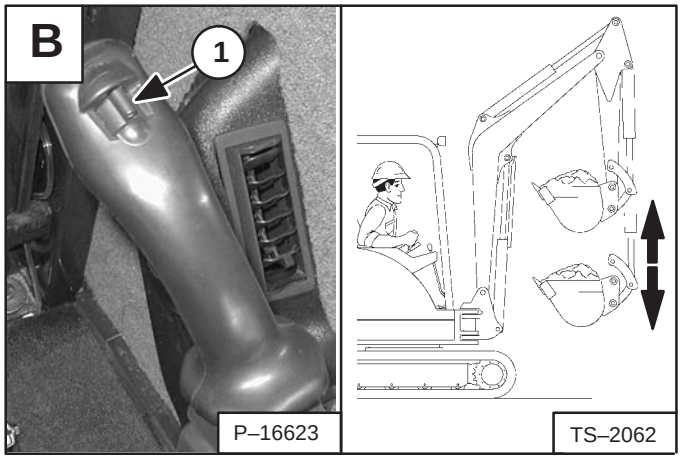
Move the lock pin (Item 2) **[A]** to the top holes (storage position).

Operate the auxiliary control on the right joystick (Item 1) **[B]** to extend and retract the arm **[B]**.

NOTE: NOTE: When transporting the excavator or when using hydraulically operated attachments, the arm must be locked in the retracted position.

Fully retract the arm and install the pin (Item 2) [A] through the lower holes of the bracket. (Be sure the pin goes through the mounting brackets *and* the moveable arm bracket.)





PARKING THE EXCAVATOR

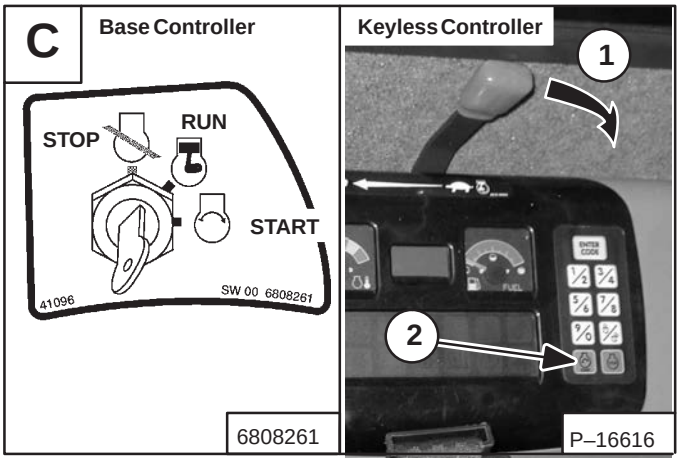
Stop the machine on level ground. Lower the work equipment and the blade to the ground.

Run the engine at idle speed for about 5 minutes to allow it to cool.

Move the speed control lever fully backward (Item 1) **[C]**.

Turn the key switch to STOP *(Base Controller)* or press the STOP Button *(Keyless Controller)* (Item 2) **[C]**.

Disconnect the seat belt. Remove the key from the switch to prevent operation of machine by unauthorized personnel. Exit machine.



TRANSPORTING THE EXCAVATOR

When transporting the machine, observe the rules, motor vehicle laws and vehicle limit ordinances. Use a transport and towing vehicle of adequate length and capacity.

Secure the parking brakes and block the wheels of the transport vehicle.

Align the ramps with the center of the transport vehicle. Secure the ramps to the truck bed and be sure ramp angle does not exceed 15 degrees.

Use metal loading ramps with a slip resistant surface.

Use ramps that are the correct length and width, and can support the weight of the machine.

The rear of the trailer must be blocked or supported when loading or unloading the excavator to prevent the front of the transport vehicle from raising.

Determine the direction of the track movement before moving the machine (blade forward).

Move the machine forward onto the transport vehicle **[A]**.

Do not change direction of the machine while it is on the ramps.

Lower the boom, arm, bucket and blade to the transport vehicle.

Stop the engine and remove the key (if equipped).

Put blocks at the front and rear of the tracks.

Fasten chains to the front corners of the blade (Item 1) **[B]** and to the tie down loop at the rear (Item 2) **[B]** to prevent it from moving when going up or down slopes, or during sudden stops.

Use chain binders to tighten the chains and then safely tie the chain binder levers to prevent loosening.

⚠ WARNING

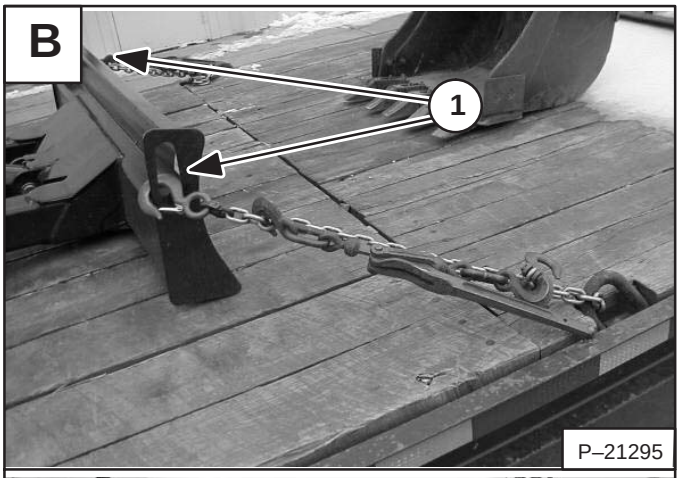
Adequately designed ramps of sufficient strength are needed to support the weight of the machine when loading onto a transport vehicle. Wood ramps can break and cause personal injury.

W–2058–0494

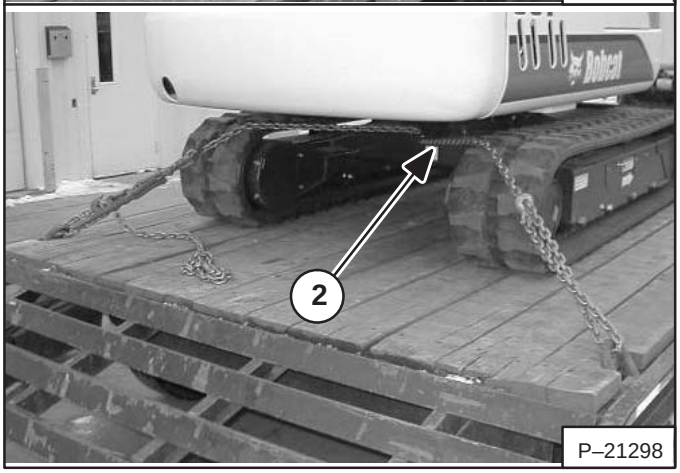
A

P–21293

B



P–21295



P–21298

LIFTING THE EXCAVATOR

Swing the upper structure so that the boom and arm are at the opposite end as the blade **[A]**.

Fully extend the cylinders of the bucket, arm & boom so that the excavator is in the position as shown **[A]**.

Raise the blade all the way.

Put the all control levers in neutral .

⚠ WARNING

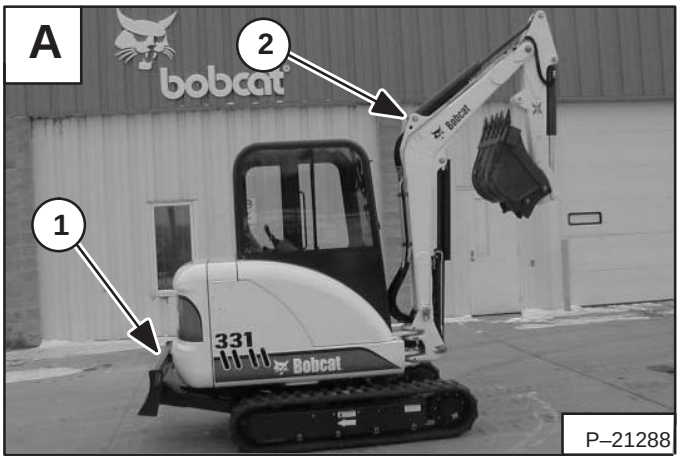
AVOID INJURY OR DEATH

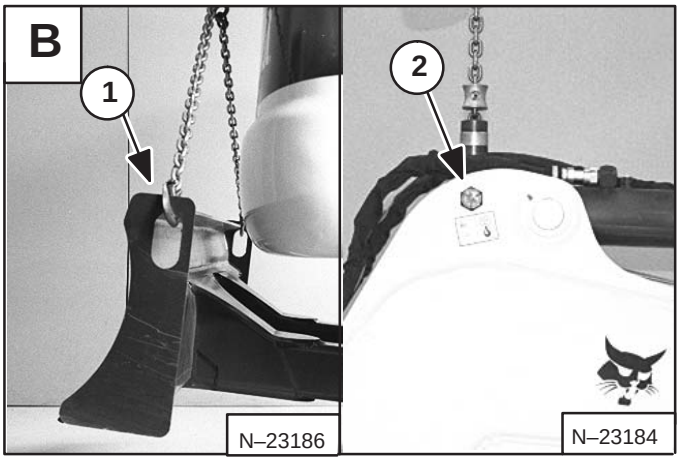
- **Use a lifting fixture with sufficient capacity for the weight of the excavator plus any added attachments.**
- **Maintain center of gravity and balance when lifting.**
- **Do not swing boom or upperstructure. Engage the swing locking lever.**
- **Never lift with operator on machine.**

W–2202–0595

Fasten chains to the ends of the blade (Item 1) **[A]** & **[B]** and up to a lifting fixture above the canopy/cab. The lifting fixture must extend over the sides of the canopy/cab to prevent the chains from hitting the ROPS/TOPS.

Install a 1 inch (25mm) bolt and nut (Grade 5 or 8) through the holes at the top of the boom (Item 2) **[A]** & **[B]**. Fasten a chain from the bolt to the lift fixture.





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MAINTENANCE SAFETY

⚠ WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W–2003–0199

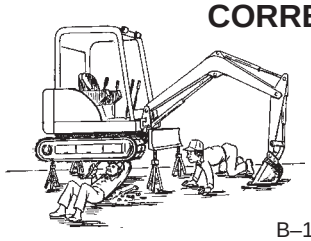
⚠ **Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.**

CORRECT

B–10731

⚠ **Never service the Bobcat Hydraulic Excavator without instructions.**

CORRECT

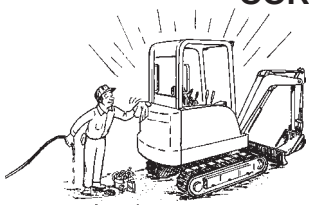


B–15797

⚠ **Use the correct procedure to lift and support the excavator.**

⚠ **Always lift the blade fully before installing jackstands.**

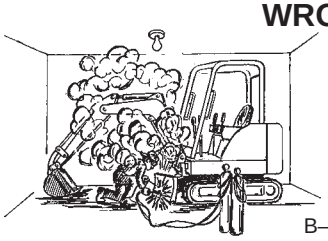
CORRECT



B–15798

⚠ **Cleaning and maintenance are required daily.**

WRONG



B–15799

⚠ **Have good ventilation when welding or grinding painted parts.**

⚠ **Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.**

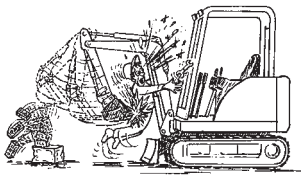
WRONG

B–15800

⚠ **Vent exhaust to outside when engine must be run for service.**

⚠ **Exhaust system must be tightly sealed. Exhaust fumes can kill without warning.**

WRONG



B–15801

⚠ **Always lower the bucket and blade to the ground before doing any maintenance.**

⚠ **Never modify equipment or add attachments not approved by Bobcat Company.**

WRONG

B–15802

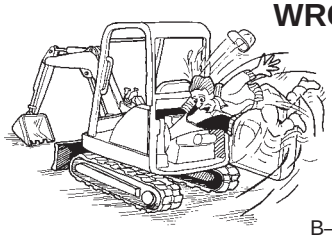
⚠ **Stop, cool and clean engine of flammable materials before checking fluid.**

⚠ **Never service or adjust machine with the engine running unless instructed to do so in the manual.**

⚠ **Avoid contact with leaking hydraulic fluid or diesel fuel under pressure. It can penetrate the skin or eyes.**

⚠ **Never fill fuel tank with engine running, while smoking or when near open flame.**

WRONG



B–15780

⚠ **Keep body, jewelry and clothing away from moving parts, electrical contacts, hot parts and exhaust.**

⚠ **Wear eye protection to guard from battery acid, compressed springs, fluids under pressure and flying debris when engines are running or tools are used. Use eye protection approved for type of welding.**

⚠ **Keep rear door closed except for service. Close and latch door before operating the excavator.**

WRONG

B–6589

⚠ **Lead–acid batteries produce flammable and explosive gases.**

⚠ **Keep arcs, sparks, flames and lighted tobacco away from batteries.**

⚠ **Batteries contain acid which burns eyes or skin on contact. Wear protective clothing. If acid contacts body, flush well with water. For eye contact flush well and get immediate medical attention.**

Maintenance procedures which are given in the Operation & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures which are **not** in the Operation & Maintenance Manual must be performed **ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL. Always use genuine Bobcat replacement parts.**

MSW21–0600

Bobcat®

SERVICE SCHEDULE

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The service schedule is a guide for correct maintenance of the Bobcat excavator.

⚠ WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W–2003–0199

SERVICE SCHEDULE		HOURS					
ITEM	**SERVICE REQUIRED**	8-10	50	100	250	500	■ 1000
Engine Coolant	Check coolant level. Add premixed coolant as needed.						
Engine Oil	Check the engine oil level and add as needed.						
Hydraulic Fluid, Hoses and Tubelines, Reservoir Breather Cap	Check the hydraulic fluid level and add as needed. Check for damage and leaks. Repair or replace as needed.						
Engine Air Filter and Air System	Check condition indicator and empty dust cup as needed. Check air system for leaks.						
Tracks	Check and adjust track tension as needed.						
Indicators and Lights	Check for correct operation of all indicators and lights.						
Operator Canopy / Cab	Check condition. Check mounting hardware.						
Seat Belt	Check condition. Check mounting hardware.						
Control Console	Check lockouts for correct operation.						
Safety Signs and Safety Treads	Check for damaged signs (decals) and safety treads. Replace any signs or safety treads that are damaged or worn.						
Pivot Points	Grease all machinery pivot points. *(21 Places)* Apply grease to extendable arm (If Equipped).						
Cab Heater Air Filter	Clean the filter as needed.						
Swing Circle and Pinion	Grease three fittings.						
Fuel Tank & Filter	Drain water and sediment from fuel tank and fuel filter.						
Battery	Check battery, cables, connections and electrolyte level. Add distilled water as needed.						
Alternator / Fan Belt	Check condition of belt and adjust as needed.		•				
Spark Arrestor Muffler	Clean the spark chamber.						
Engine Oil and Filter	Replace oil & filter. Use CD or better grade oil and Bobcat filter.		•				
Fuel Filter	Replace fuel filter.						
Final Drive Case	Check lubricant level in both final drive cases.			♦			
Radiator, oil cooler, *A/C	Clean debris from the radiator fins.						
Hydraulic Filter	Replace the filter element.			♦			
Alternator & Starter	Check the alternator and starter connections.		•				
Engine Valves	Check and adjust the engine valve clearance.						
Case Drain Filter	Replace the filter.						
Final Drive Case	Replace lubricant in both final drive cases.						
Engine Cooling System	Drain and flush the cooling system. Replace the coolant.						
Hydraulic System	Replace the hydraulic fluid and filter. Clean the Reservoir.			♦			

*** If Equipped**
• Also at *first* 50 Hours
♦ Also at *first* 100 hours
■ Or every 6 months.

TAILGATE

Opening And Closing The Tailgate

⚠ WARNING

AVOID INJURY

Never service or adjust the machine when the engine is running unless instructed to do so in the manual.

W–2012–0497

Keep the rear door closed when operating the machine. Failure to do so could seriously injure a bystander.

W–2020–1285

Release the latch (Item 1) **[A]** and pull the tailgate open.

Push firmly to close the tailgate.

The tailgate latch can be locked (Item 2) **[A]**. Use the excavator key to unlock.

Adjusting The Bumper

The door bumper (Item 1) **[B]** can be adjusted for alignment with the tailgate.

Close the tailgate before operating the excavator.

Adjusting The Tailgate Latch

The door catch (Item 1) **[C]** can be adjusted by loosening the bolt and moving the cylinder the tighten the nut.

Close the tailgate before operating the excavator.

AIR CLEANER

See the *SERVICE SCHEDULE* Page 35 for the correct service interval.

Daily Check

Check the condition indicator (Item 1) **[D]**. If the red ring shows in the condition indicator, the filter element needs to be replaced.

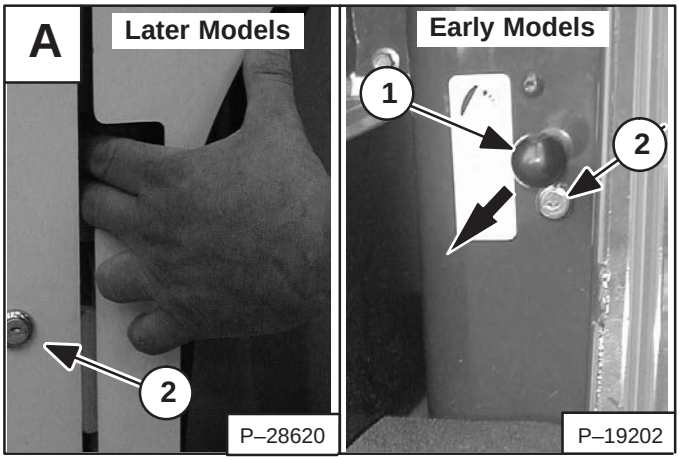
Replace the inner filter every third time the outer filter is replaced or as indicated on Page 37.

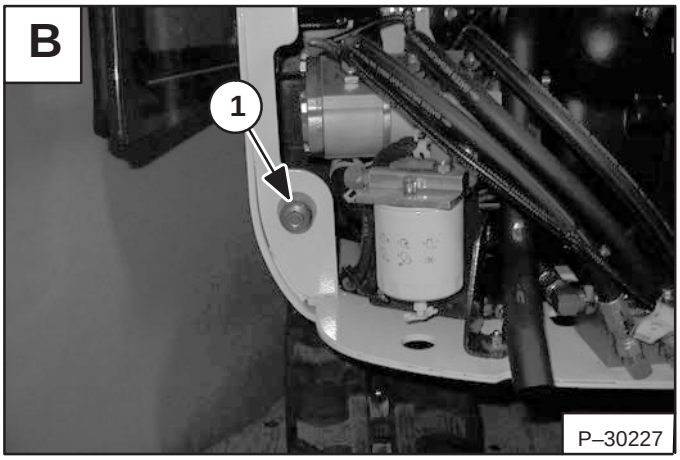
Replacing The Filters

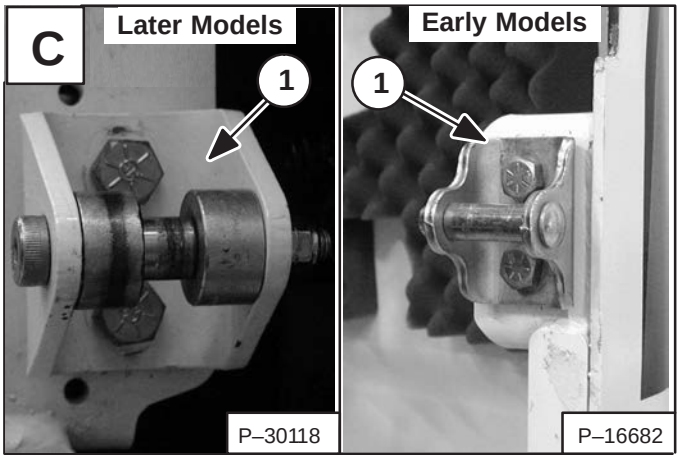
Outer Filter

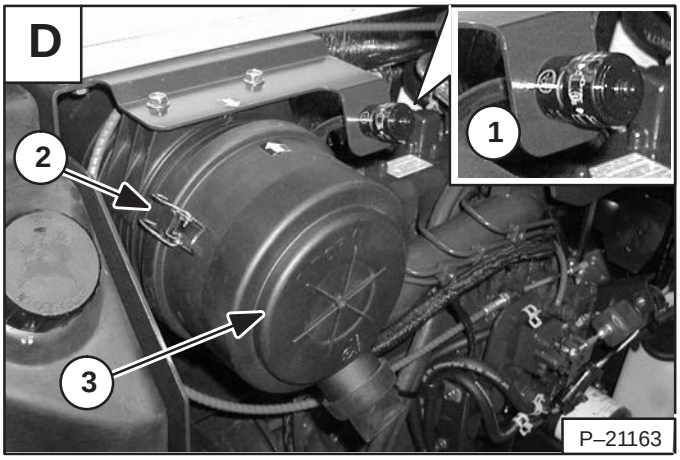
Release the two fasteners (Item 2) **[D]**.

Remove and clean the dust cup (Item 3) **[D]**.









AIR CLEANER SERVICE (Cont'd)

Outer Filter (Cont'd)
Pull the outer filter from the air cleaner housing **[A]**.

Check the housing for damage.

Clean the housing and the seal surface. Do Not use compressed air.

Install a new element.

Install the dust cup (Item 1) **[B]** and engage the fasteners (Item 2) **[B]**.

Check the air intake hose and the air cleaner housing for damage. Make sure all connections are tight.

Inner Filter

Only replace the inner filter element under the following conditions:

- Replace the inner filter element every *third* time the outer filter is replaced.
- After the outer element has been replaced, press the button (Item 3) **[B]** on the top of the condition indicator and start the engine. Run at full RPM, then reduce engine speed and stop the engine. If the red ring shows in the condition indicator, replace the inner filter element.

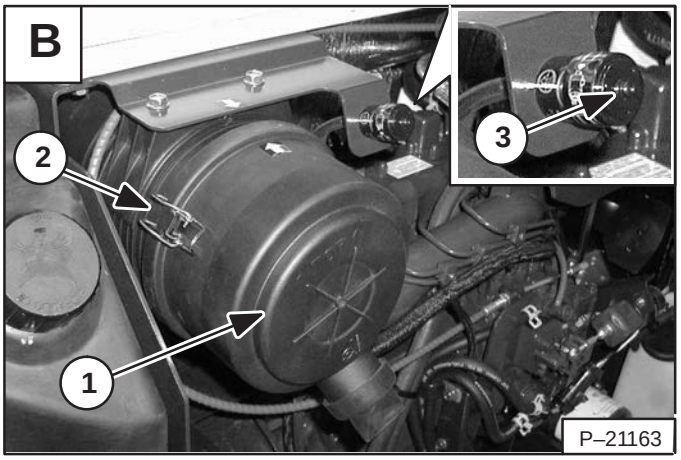
Remove the dust cup, outer filter and inner filter.

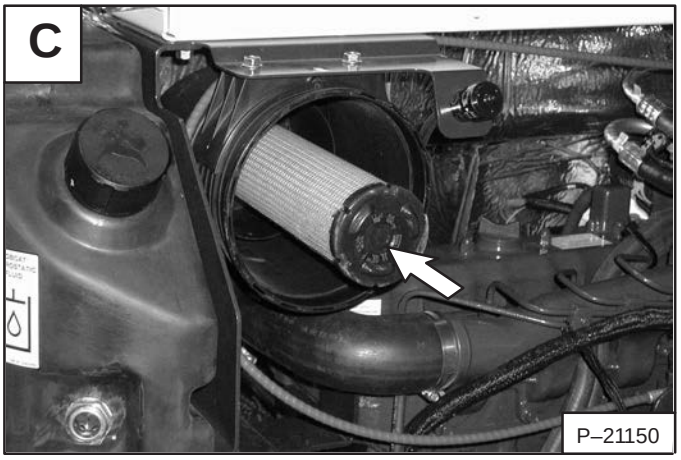
NOTE: Make sure all sealing surfaces are free of dirt and debris.

Install the new inner element **[C]**.

Install the outer element and the dust cup **[B]**.

Press the button on the condition indicator (Item 3) **[B]** to remove the red ring.





HEATER AIR FILTERS (With Cab Option Only)

The heater filter(s) must be cleaned regularly. The filter(s) are located at the left of the operator seat **[D]**.

Fresh Air Filter

Remove the cover (Item 1) **[D]**.

Remove the filter (Item 2) **[D]**. Use low air pressure to clean the filter; or replace when very dirty.

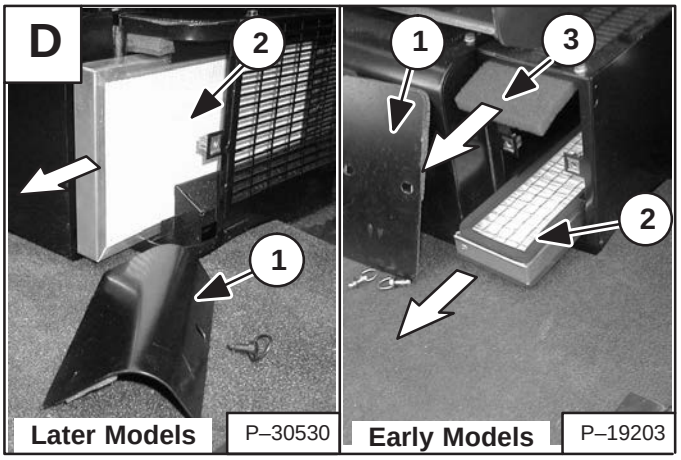
Install the filter and the cover.

Recirculation Filter (Early Models Only)

Remove the cover (Item 1) **[D]**.

Remove the filter (Item 3) **[D]** and wash the filter with a mild detergent and water.

Install the filter (after dry) and the cover.



BELT ADJUSTMENT

Water Pump Belt

Loosen the idler bolt (Item 1) **[A]** and move the idler to the rear of the machine until there is 0.15 inch (3.8 mm) belt deflection (Item 2) **[A]** with 5 lbs (2 kg) force.

Tighten the idler bolt (Item 1) **[A]**.

Alternator Belt (Without Air Conditioning)

Loosen the alternator adjustment and mounting bolts (Items 3 & 4) **[A]**.

Move the alternator toward the front of the machine until there is 0.22 inch (6 mm) belt deflection (Item 5) **[A]** with 2.5 lbs. (1kg) force.

Tighten the adjustment bolt (Item 3) **[A]** and the mounting bolt (Item 4) **[A]**.

Alternator and Air Conditioning Belt

NOTE: The alternator and air conditioner compressor are driven by the same belt.

Loosen the air conditioner compressor adjustment and mounting bolts (Items 1 & 2) **[B]**.

Move the air conditioner compressor toward the rear of the machine until there is 0.20 inch (5 mm) belt deflection (Item 3) **[B]** with 5 lbs. (2 kg) force.

Tighten the adjustment bolt (Item 1) **[B]** and the mounting bolt (Item 2) **[B]**.

FUEL SYSTEM

Fuel Specifications

Use only clean, high quality diesel fuel, Grade No. 2 or Grade No. 1.

The following is a suggested blending guideline which should prevent fuel gelling problems during freezing temperatures:

Temp. F° (C°)	No. 2	No.1
+15°(9°)	100%	0%
Down to –20° (–29°)	50%	50%
Below –20° (–29°)	0%	100%

See your fuel supplier for local recommendations.

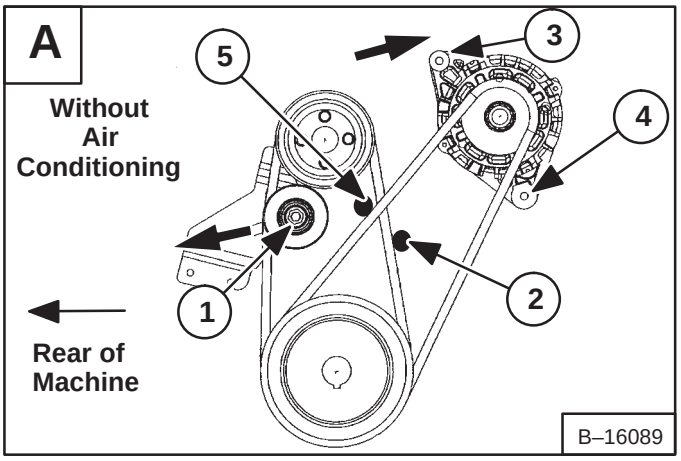
Filling The Fuel Tank

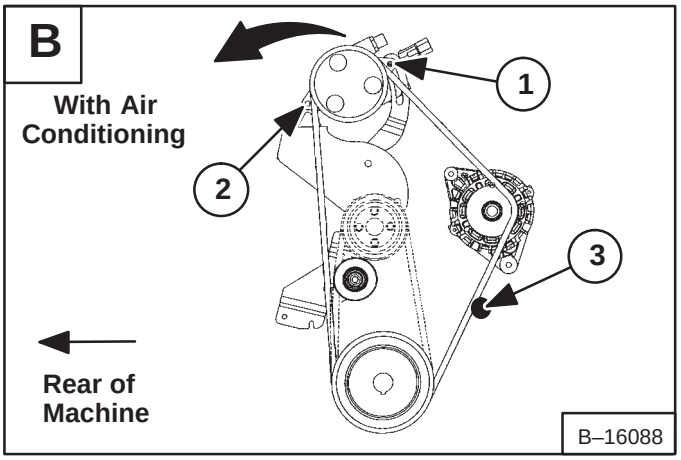
Open the side cover and remove the fuel fill cap (Item 1) **[C]**.

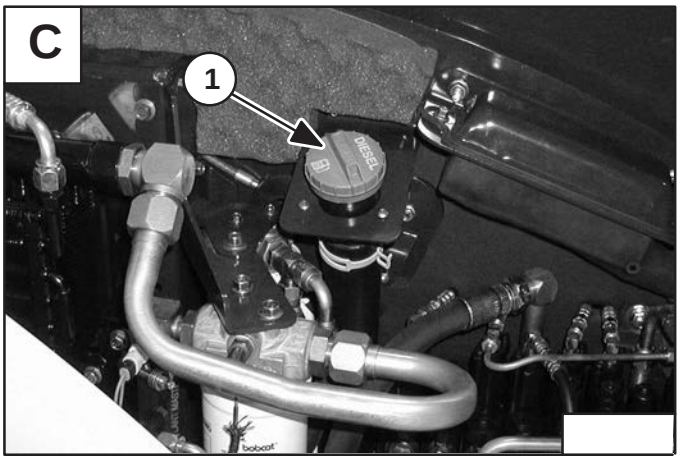
Use a clean, approved safety container to add fuel. Add fuel only in an area that has a free movement of air and no flames or sparks. **NO SMOKING!**

Install and tighten the fuel fill cap. Close the side door.

See the *SERVICE SCHEDULE,* Page 35 for the service interval when to remove water from or replace the fuel filter.







⚠ WARNING

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W–2103–1285

Stop and cool the engine before adding fuel. NO SMOKING! Failure to obey warnings can cause an explosion or fire.

W–2063–0887

FUEL SYSTEM (Cont'd)

Removing Water From The Fuel Filter

See the *SERVICE SCHEDULE,* Page 35 for the service interval when to remove the water from the fuel filter.

Open the tailgate.

Loosen the drain (Item 1) **[A]** at the bottom of the filter element to drain water from the filter.

Fuel Filter

See the *SERVICE SCHEDULE,* Page 35 for the service interval when to replace the fuel filter.

Remove the filter element (Item 2) **[A]** and clean the area around the filter housing.

Put oil on the seal of the new filter element; install the fuel filter, and hand tighten.

Remove the air from the fuel system. (See below)

Removing Air From The Fuel System

After replacing the fuel filter or when the fuel tank has run out of fuel, air must be removed from the fuel system before starting the engine.

Open the fuel filter vent (Item 1) **[B]** and operate the hand pump (priming bulb) (Item 2) **[A]** until the fuel flows from the vent with no air bubbles.

Close the vent (Item 1) **[B]**.

Start the engine. It may be necessary to open the vent (Item 3) **[B]** (at the fuel injection pump) briefly until the engine runs smoothly.

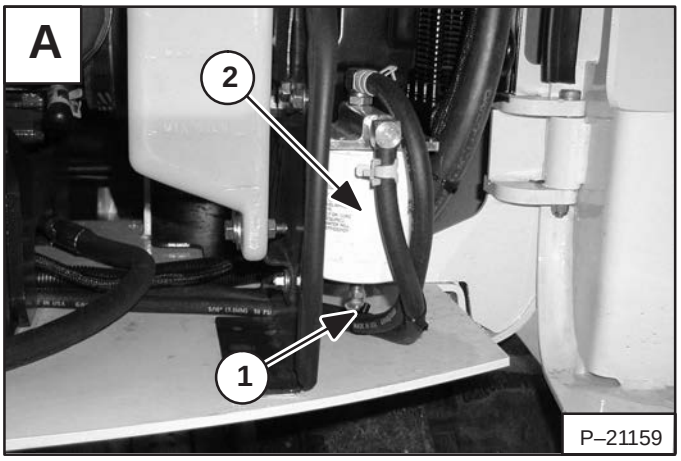
Draining The Fuel Tank

See the *SERVICE SCHEDULE,* Page 35 for the correct service interval.

Remove the hose (Item 4) **[B]** from the fuel injection pump. Route the hose to the bottom of the engine compartment and out the tailgate.

Drain the fuel into a container.

Reuse, recycle or dispose of fuel in an environmentally safe manner.



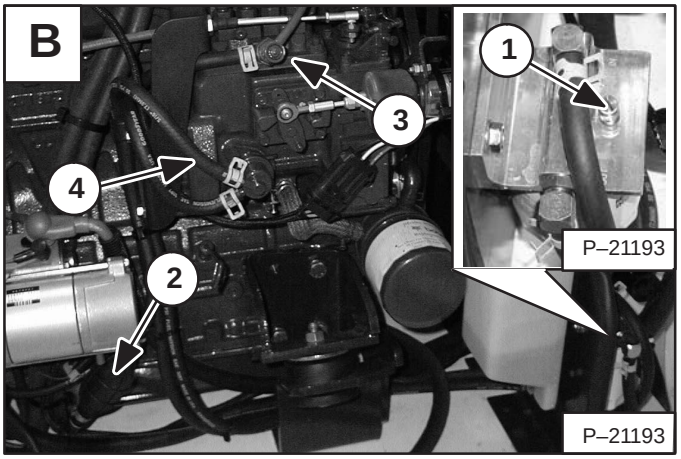
⚠ WARNING

Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a physician familiar with this injury.

W–2072–0496

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W–2103–1285



ENGINE LUBRICATION SYSTEM

Checking Engine Oil

Check the engine oil every day before starting the engine for the work shift.

Open the tailgate and remove the dipstick (Item 1) **[A]**.

Keep the oil level between the marks on the dipstick.

Use a good quality motor oil that meets the correct API Service Classification. (See *FUEL, COOLANT AND LUBRICANTS Chart*, Page 81.)

Replacing Oil And Filter

See the *SERVICE SCHEDULE,* Page 35 for the service interval for replacing the engine oil and filter.

Route the drain hose our the tailgate and run the engine until it is at operating temperature. Stop the engine.

Open the tailgate.

Route the drain hose out the tailgate. Remove the drain cap (Item 2) **[A]**. Drain the oil into a container.

Recycle or dispose of used oil in an environmentally safe manner.

Remove the oil filter (Item 3) **[A]** and clean the filter housing surface.

Use a genuine Bobcat replacement filter element.

Put clean oil on the filter gasket. Install the filter and hand tighten.

Install and tighten the oil drain cap.

Remove the fill cap (Item 4) **[A]**.

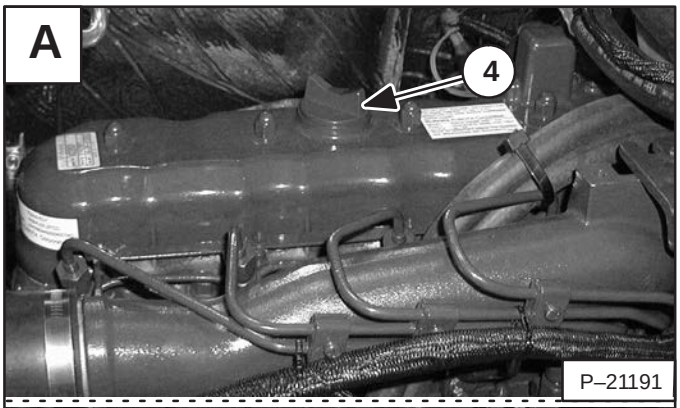
Put oil in the engine. (See *FUEL, COOLANT AND LUBRICANTS Chart,* Page 81.)

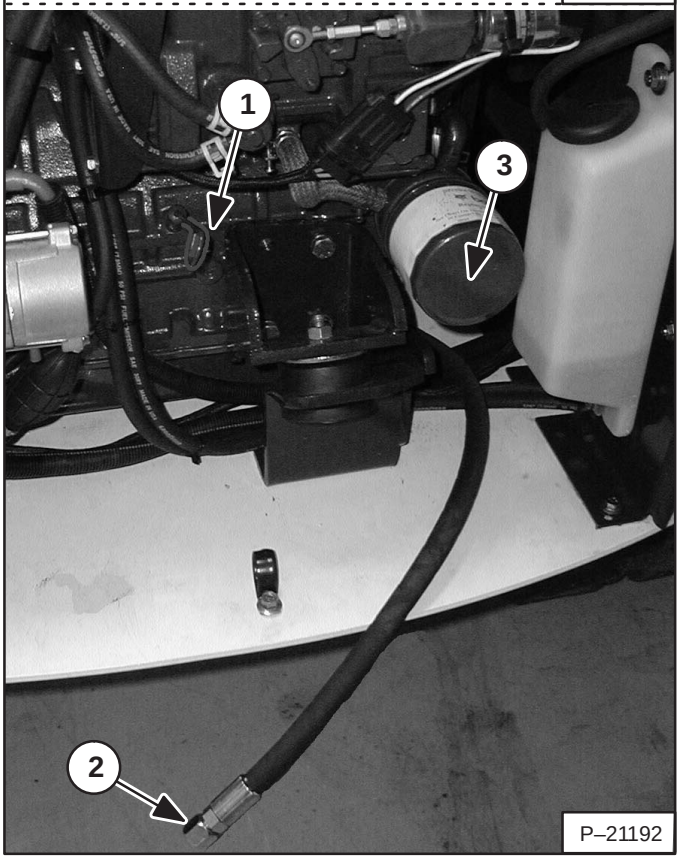
Install the fill cap.

Start the engine and let it run for several minutes.

Stop the engine. Check for leaks at the oil filter. Check the oil level.

Add oil as needed if it is not at the top mark on the dipstick.





COOLING SYSTEM

Check the cooling system every day to prevent over–heating, loss of performance or engine damage.

Cleaning The Cooling System

Open the tailgate.

Use low air pressure or water pressure to clean the radiator and oil cooler **[A]**. Be careful not to damage fins when cleaning.

Checking Coolant Level

⚠ WARNING

Do not remove radiator cap when the engine is hot. You can be seriously burned.

W–2070–1285

Open the tailgate.

Check the coolant level in the coolant recovery tank (Item 1) **[B]**.

The coolant level must be between the MIN and MAX marks on the coolant recovery tank when the engine is cold.

NOTE: The cooling system is factory filled with propylene glycol (purple color). DO NOT mix propylene glycol with ethylene glycol.

IMPORTANT

AVOID ENGINE DAMAGE

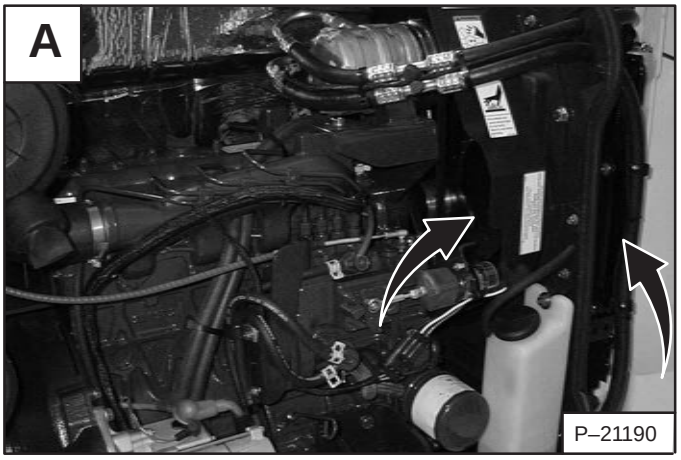
Always use the correct ratio of water to anti-freeze.

Too much antifreeze reduces cooling system efficiency and may cause serious premature engine damage.

Too little antifreeze reduces the additives which protect the internal engine components; reduces the boiling point and freeze protection of the system.

Always add a premixed solution. Adding full strength concentrated coolant can cause serious premature engine damage.

I–2124–0497

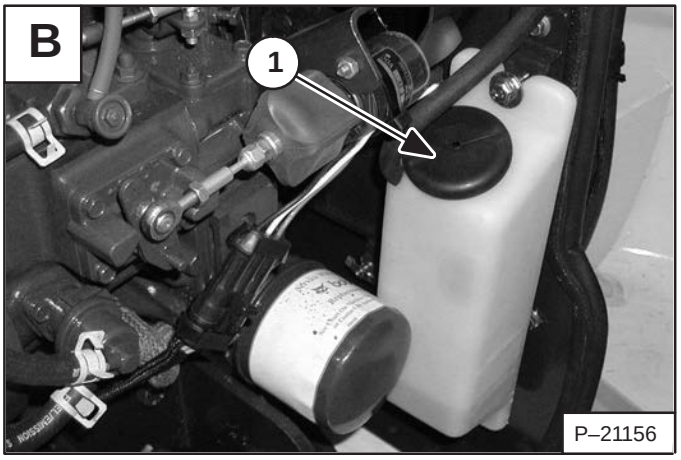


⚠ WARNING

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- **When fluids are under pressure.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

W–2019–1285



Replacing The Coolant

See the *SERVICE SCHEDULE,* Page 35 for the correct service intervals.

⚠ WARNING

Do not remove radiator cap when the engine is hot. You can be seriously burned.

W–2070–1285

When the engine is cool, loosen and remove the radiator cap (Item 1) **[A]**.

Put a hose on the drain valve at the bottom of the radiator. Open the drain valve (Item 1) **[B]** and drain the coolant into a container.

Put a hose on the drain valve on the engine block. Open the drain valve (Item 1) **[C]** drain the coolant into a container.

After all the coolant is removed, close both drain valves.

Recycle or dispose of the used coolant in an environmentally safe manner.

Mix the coolant in a separate container. (See *FUEL, COOLANT AND LUBRICANTS Chart,* Page 81, for correct capacity.)

NOTE: The cooling system is factory filled with propylene glycol (purple color). DO NOT mix propylene glycol with ethylene glycol.

Add premixed coolant; 47% water and 53% propylene glycol to the recovery tank if the coolant level is low.

One gallon and one pint of propylene glycol mixed with one gallon of water is the correct mixture of coolant to provide a –34°F (–37°C) freeze protection. (See **IMPORTANT**, Page 41.)

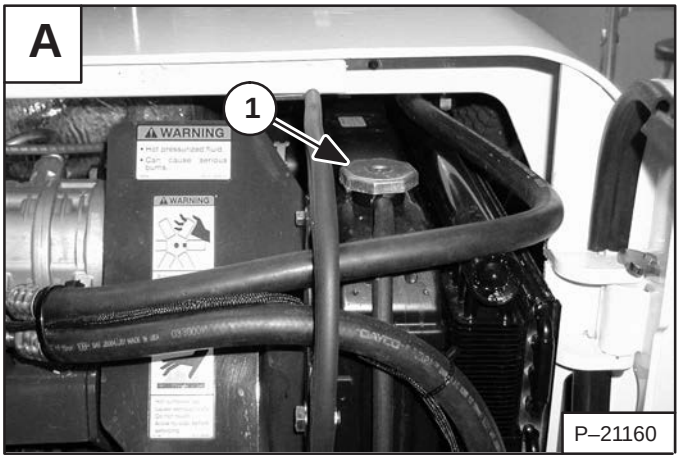
Use a refractometer to check the condition of propylene glycol in your cooling system.

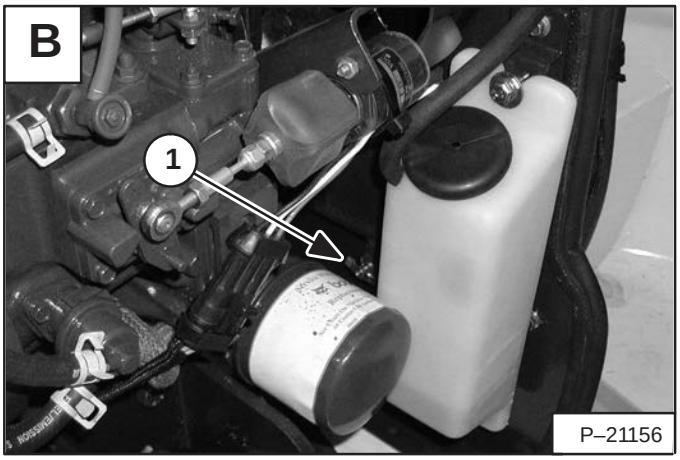
Add premixed coolant until the level is correct.

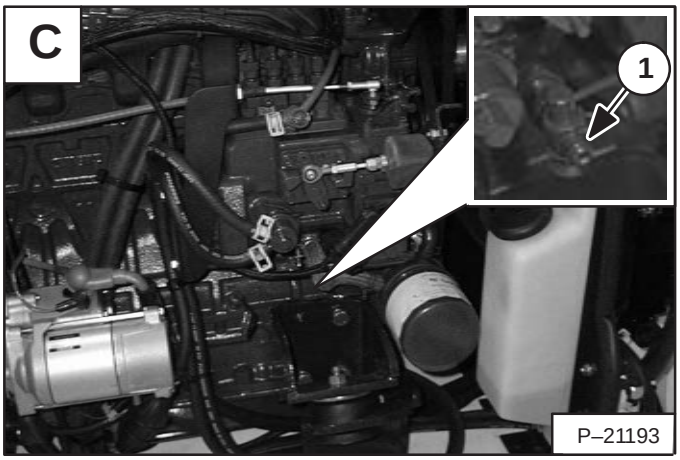
Run the engine until it is at operating temperature. Stop the engine. Check the coolant level and add as needed. Be sure the radiator cap is tight.

Add coolant to the recovery tank as needed.

Close the tailgate.







ELECTRICAL SYSTEM

Description

The excavator has a 12 volt, negative ground electrical system. The electrical system is protected by fuses located under the cover at the right side of the excavator (Item 1) **[A]**. The fuses will protect the electrical system when there is an electrical overload. The reason for the overload must be found before starting the engine again.

The battery cables must be clean and tight. Check the electrolyte level in the battery. Add distilled water as needed. Remove acid or corrosion from the battery and cables with a sodium bicarbonate and water solution.

Put Battery Saver P/N 6664458 or grease on the battery terminals and cable ends to prevent corrosion.

⚠ WARNING

Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

If electrolyte is taken internally drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.

W–2065–1296

Fuse & Relay Location

A decal is inside the cover to show location and amp ratings.

Remove the cover to check or replace the fuses and relays.

The location and sizes are shown below and **[B]**.

Fuses

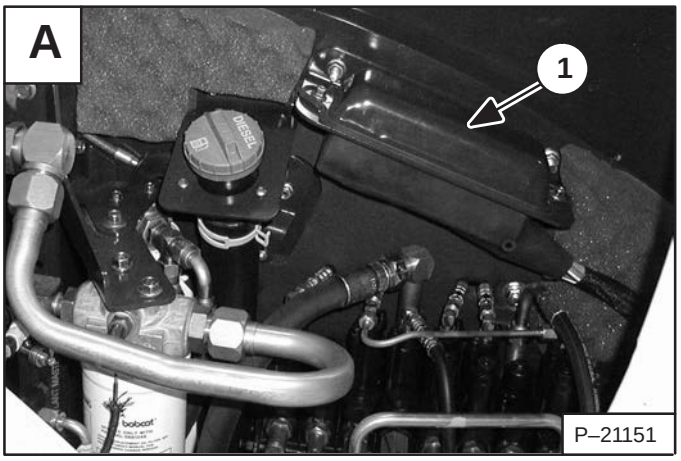
Ref	Description	Amp.	Ref	Description	Amp.
1	Wiper	5	**7**	Ignition	5
2	Switched Power	20	**8**	Fuel Solenoid	25
3	Alternator/Power Relay	25	**9**	Controller	25
4	**A**ttach. **C**ontrol **D**evice	25	**10**	**A**ttach. **C**ontrol **D**evice	25
5	*Not Used*	–	**11**	Lights	20
6	Air Cond., Heater Fan	25	**12**	Accessory Plug	15

Always replace fuses using the same type and capacity.

Relays

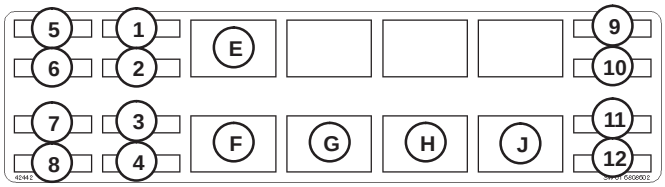
Ref	Description
E	Switched Power
F	Fuel Solenoid
G	Lights
H	Glow Plugs
J	Starter

A



P–21151

B



Fuses **R e l a y s** **Fuses**

6808602

Using A Booster Battery (Jump Starting)

If it is necessary to use a booster battery to start the engine. BE CAREFUL! There must be one person in the operator's seat and one person to connect and disconnect the battery cables.

Be sure the key switch is OFF. The booster battery must be 12 volt.

Open the tailgate.

Connect one end of the first cable to the positive (+) terminal of the booster battery. Connect the other end of the same cable to the positive (+) terminal (Item 1) **[A]** of the excavator starter.

Connect the end of the second cable to the negative (–) terminal of the booster battery. Connect the other end of the same cable to the negative excavator cable (Item 2) **[A]** where it is fastened to the frame.

NOTE: See *Cold Temperature Starting Procedure*, Page 20.

Start the engine. After the engine has started, remove the ground (–) cable first (Item 2) **[A]**.

Disconnect the cable from the excavator starter (Item 1) **[A]**.

⚠ WARNING

Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

If electrolyte is taken internally drink large quantities of water or milk. DO NOT induce vomiting. Get prompt medical attention.

W–2065–1296

Keep arcs, sparks, flames and lighted tobacco away from batteries. When *jumping* from booster battery make final connection (negative) at engine frame.

Do not jump start or charge a frozen or damaged battery. Warm battery to 60ºF. (16ºC.) before connecting to a charger. Unplug charger before connecting or disconnecting cables to battery. Never lean over battery while boosting, testing or charging.

Battery gas can explode and cause serious injury.

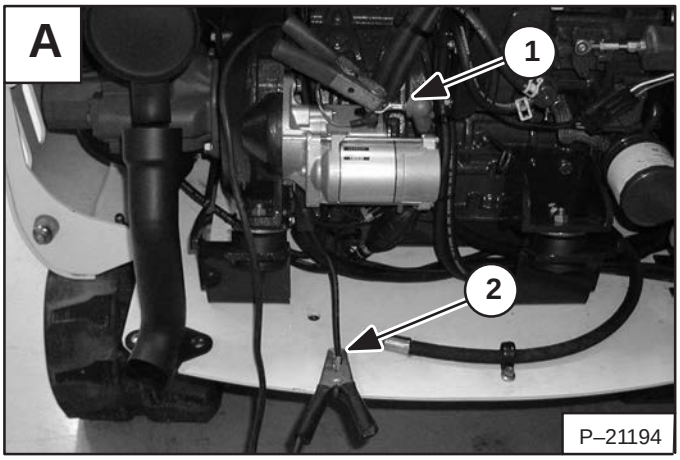
W–2066–1296

IMPORTANT

If jump starting the excavator from a second machine:

When jump starting the excavator from a battery installed in a second machine. Make sure that the second machine is NOT running while using the glow plugs. High voltage spikes from a running machine can burn out the glow plugs.

I–2060–0195



IMPORTANT

Damage to the alternator can occur if:

- **Engine is operated with battery cables disconnected.**
- **Battery cables are connected when using a fast charger or when welding on the loader. (Remove both cables from the battery.)**
- **Extra battery cables (booster cables) are connected wrong.**

I–2023–1285

ELECTRICAL SYSTEM (Cont'd)

Removing And Installing The Battery

Open the tailgate.

Disconnect the negative (–) cable (Item 1) **[A]** first.

Disconnect the positive (+) cable (Item 2) **[A]**.

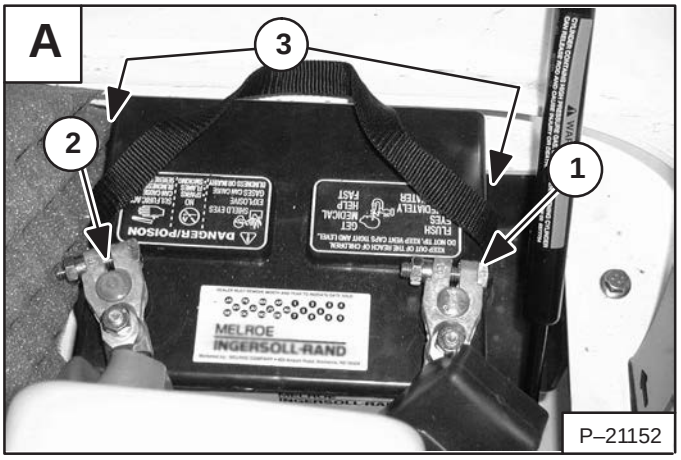
Remove the bolts (Item 3) **[A]** and remove the hold down clamp.

Remove the battery.

Always clean the terminals and the cable ends, even when installing a new battery.

Install the battery. Install the hold down clamp and tighten the bolts.

Connect the battery cables. Connect the negative (–) cable (Item 1) **[A]** last to prevent sparks.



⚠ WARNING

Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

If electrolyte is taken internally drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.

W–2065–1296

HYDRAULIC SYSTEM

Checking And Adding Fluid

Put the machine on a flat level surface.

Retract the arm and bucket cylinders, put the bucket on the ground and raise the blade. Stop the engine.

Open the tailgate.

Check the hydraulic fluid level, it must be visible in the sight gauge (Item 1) **[A]**.

Clean the surface around the reservoir (breather) cap and remove the cap from the reservoir (Item 2) **[A]**.

Check the condition of the fill strainer screen (Item 1) **[B]**. Clean or replace as necessary.

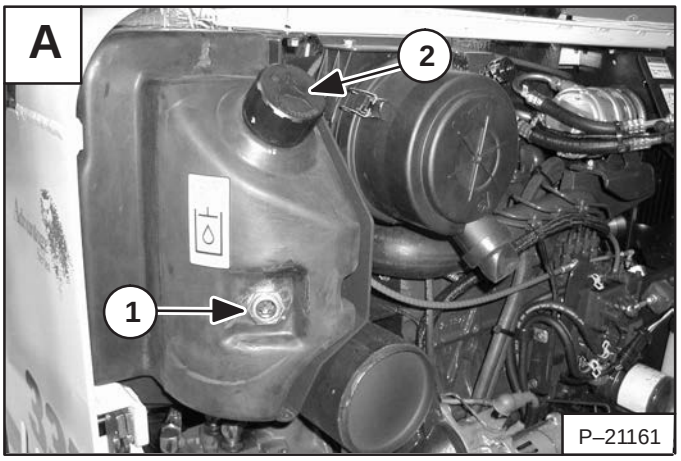
Be sure the screen is installed before adding oil.

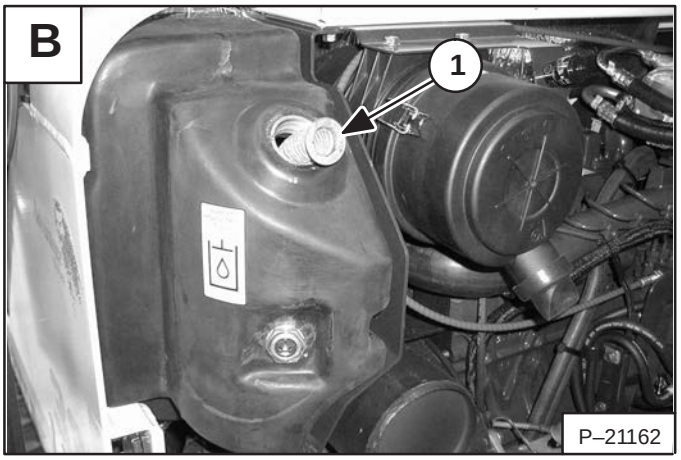
Add the correct fluid to the reservoir until it is visible in the sight gauge. (See *FUEL, COOLANT AND LUBRICANTS Chart,* Page 81.)

Check the breather cap and clean as necessary. Replace the cap if damaged.

Install the reservoir cap.

Close the tailgate.





Replacing The Hydraulic Oil

See the *SERVICE SCHEDULE,* Page 35 for the correct service interval.

Retract the arm and bucket cylinders, lower the bucket to the ground. Stop the engine.

Open the tailgate.

Remove the drain plug (Item 1) **[A]**.

Drain the fluid into a container.

Recycle or dispose of the fluid in an environmentally safe manner.

Install the drain plug (Item 1) **[A]**.

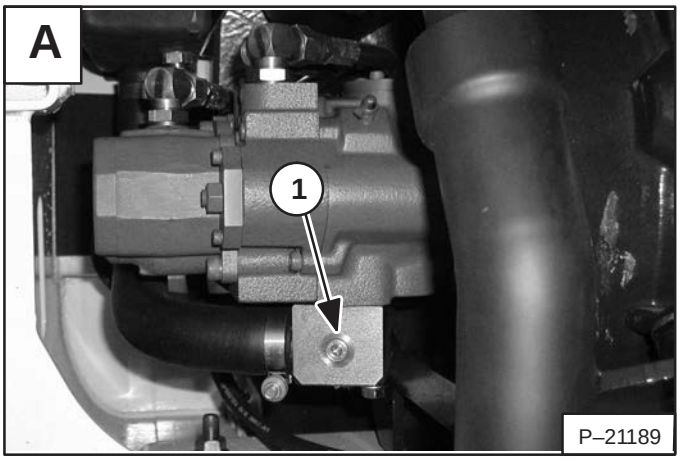
Add fluid to the reservoir. (See *FUEL, COOLANT AND LUBRICANTS Chart,* Page 81.)

Run the machine through the hydraulic functions. Stop the engine. Check the fluid level and add as needed.

⚠ WARNING

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W–2103–1285



⚠ WARNING

Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a physician familiar with this injury.

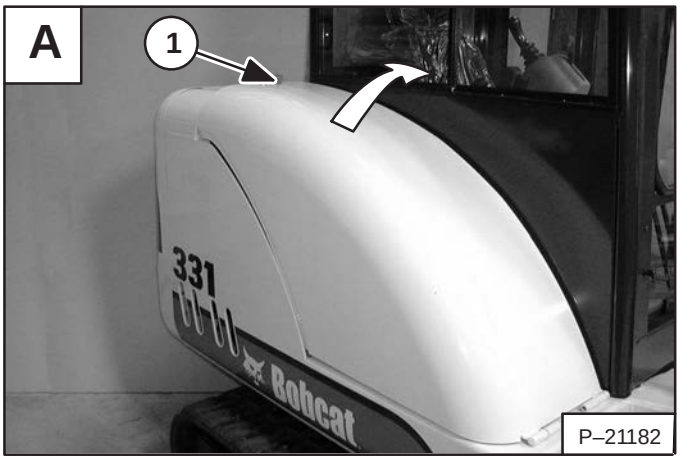
W–2072–0496

Replacing the Hydraulic Filter

See the *SERVICE SCHEDULE,* Page 35 for the correct service interval.

Pull the latch (Item 1) **[A]** and open the right side cover.

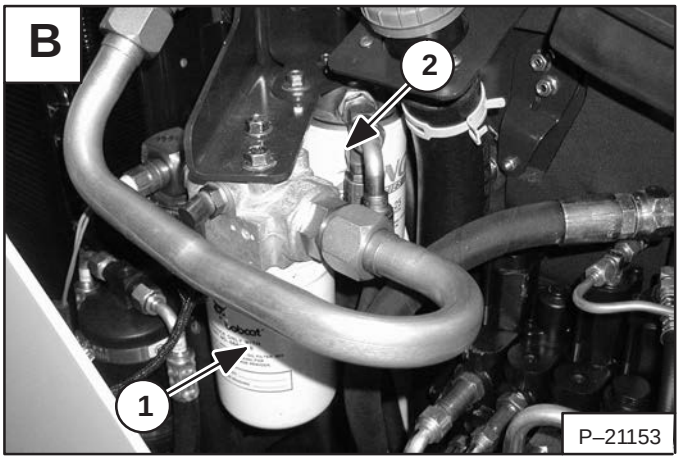
Tilt the cover forward until the stop engages.



Remove the filter element (Item 1) **[B]**.

Clean the housing where the filter gasket makes contact.

Put clean hydraulic fluid on the gasket. Install the new filter element and hand tighten only.



Replacing the Case Drain Filter

Open the right side cover **[A]**.

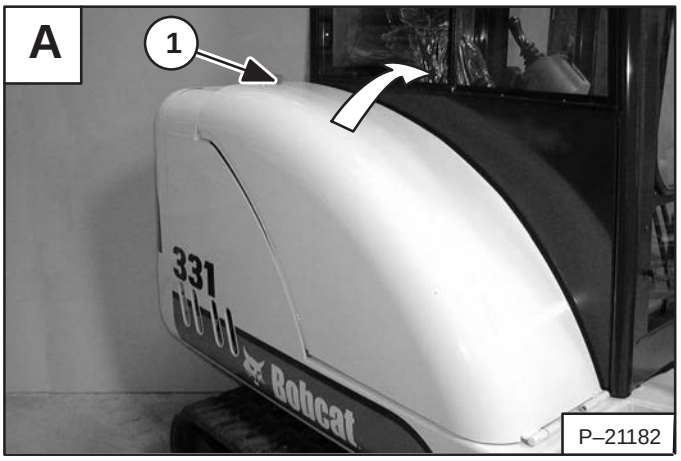
Remove the filter element (Item 2) **[B]**.

Clean the housing where the filter gasket makes contact.

Put clean hydraulic fluid on the gasket. Install the new filter element and hand tighten only.

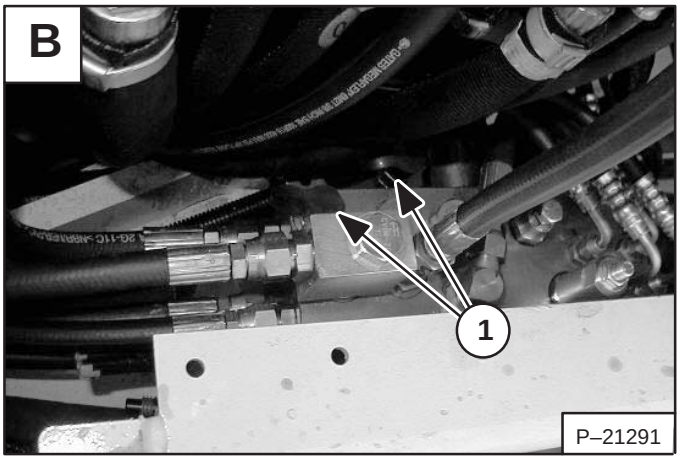
Diagnostic Couplers

Open the side cover **[A]**.



Diagnostic couplers (Item 1) are located on the hydraulic circuitry **[B]**.

The couplers can be used to check circuit pressures. (Refer to the Service Manual.)



SPARK ARRESTOR MUFFLER (If Equipped)

See the *SERVICE SCHEDULE,* Page 35 for the correct service interval.

Do not operate the excavator with a defective exhaust system.

IMPORTANT

This excavator is factory equipped with a U.S.D.A. Forestry Service approved spark arrestor muffler. It is necessary to do maintenance on this spark arrestor muffler to keep it in working condition. The spark arrestor muffler must be serviced by dumping the spark chamber every 100 hours of operation.

If this machine is operated on flammable forest, brush or grass covered land, it must be equipped with a spark arrestor attached to the exhaust system and maintained in working order. Failure to do so will be in violation of California State Law, Section 4442 PRC.

Make reference to local laws and regulations for spark arrestor requirements.

I–2061–0195

⚠ WARNING

When the engine is running during service, the steering levers must be in neutral.

Failure to do so can cause injury or death.

W–2203–0595

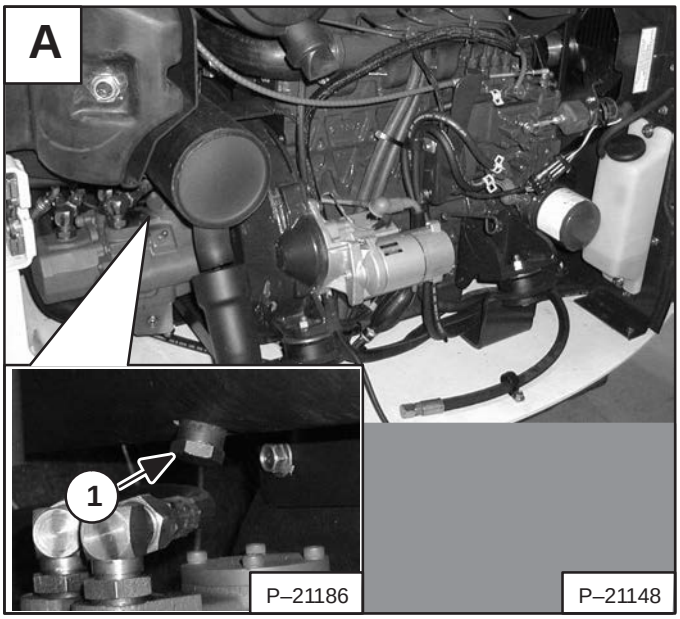
Stop the engine. Open the tailgate.

Remove the plug (Item 1) **[A]** from the bottom of the muffler.

Start the engine and run for about 10 seconds while a second person, wearing safety glasses, holds a piece of wood over the outlet of the muffler. The carbon deposits will be forced out of the muffler plug hole (Item 1) **[A]**.

Stop the engine. Install and tighten the plug.

Close the tailgate.



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Make reference to local laws and regulations for spark arrestor requirements.

I–2061–0195

TRACK TENSION

NOTE: The wear of the pins and bushings on the undercarriage vary with the working conditions and the different types of soil conditions. It is necessary to inspect track tension and maintain the correct tension. See Service Schedule, Page 35 for the correct service interval.

Raise one side of the machine (Approximately four inches) using the boom and arm **[A]**.

Raise the blade fully and install jackstands under the blade and track frame (Item 1) **[A]**. Lower the boom until all machine weight is on the jackstands.

Stop the engine.

⚠ WARNING

AVOID INJURY

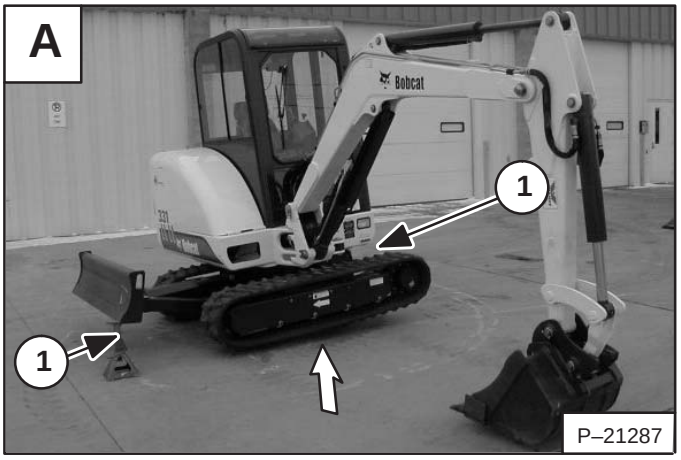
Keep fingers and hands out of pinch points when checking the track tension.

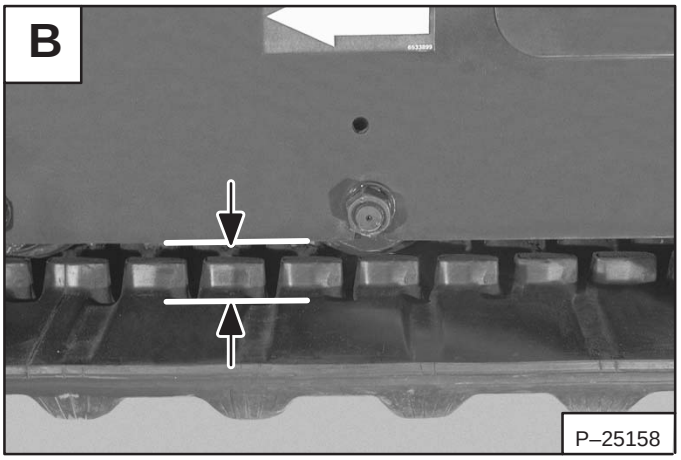
W–2142–0189

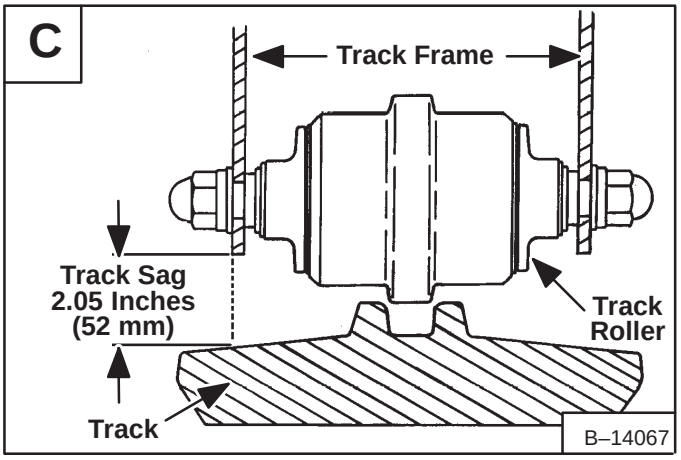
Rubber Track Clearance

Measure the rubber track clearance at the center of the track frame between the bottom of the track frame and the contact surface of the track **[B]** & **[C]**. Do Not get fingers into pinch points between the track and the track roller.

Rubber Track Clearance
2.05 inch (52 mm)





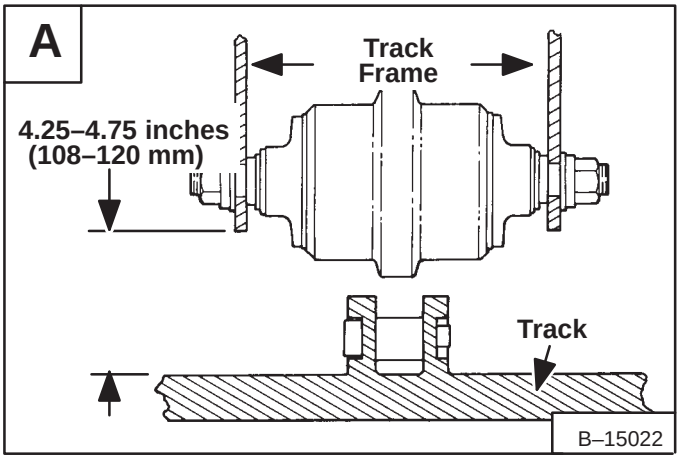


TRACK TENSION (Cont'd)

Steel Track Clearance

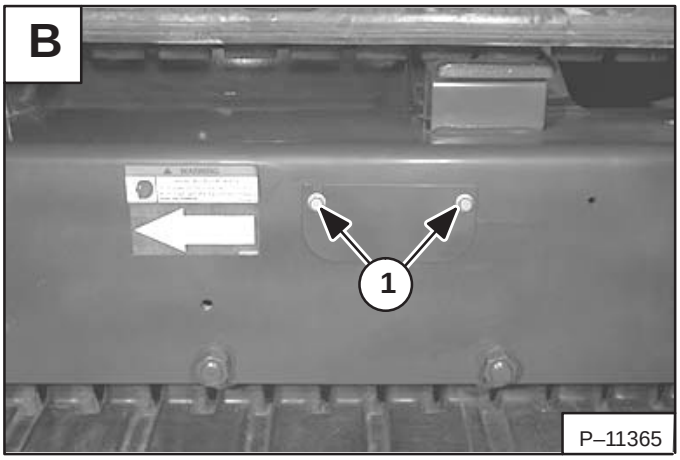
Measure the steel track clearance at the center of the track, between the bottom of the track frame and the contact surface of the track **[A]**. Do Not get fingers into pinch points between the track and the track roller.

Steel Track Clearance
4.25–4.75 inches (108–120 mm)

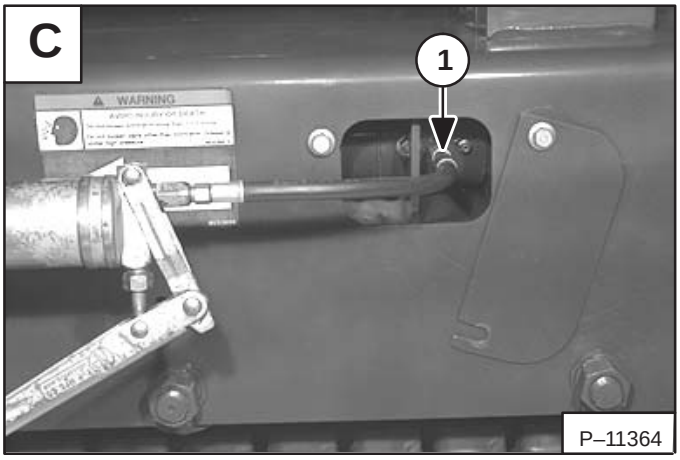


Adjustment

Loosen the two bolts from the cover (Item 1) **[B]**. Pivot the cover downward.



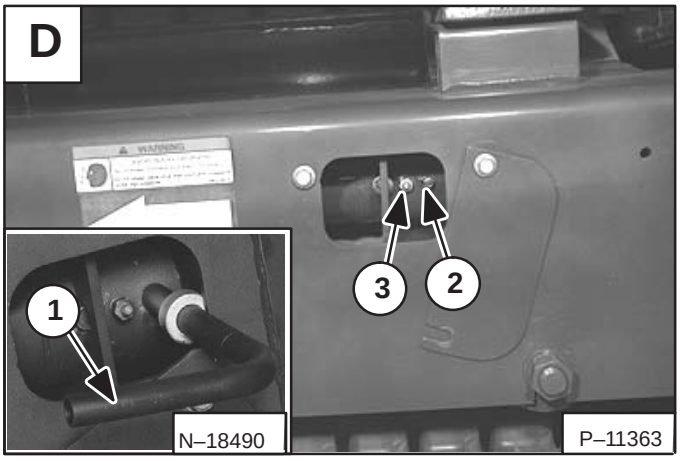
Add grease to the fitting (Item 1) **[C]** until the track tension is correct.



Use tool MEL –1560 (Item 1) **[D]** to loosen the bleed fitting (Item 2) **[D]** to release tension from the track.

NOTE: Do not loosen the grease fitting (Item 3) [D].

Repeat the procedure for the other side.



TRAVEL MOTOR

Checking Oil Level

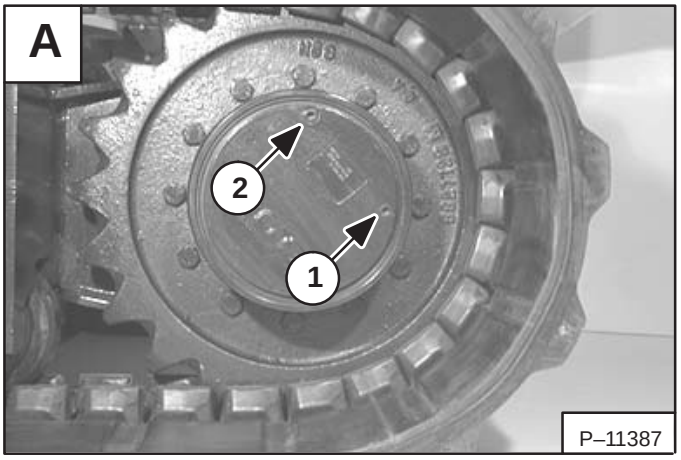
Put the machine on a level surface with the plugs positioned as shown (Item 1 & 2) **[A]**.

Remove the plug (Item 1) **[A]**. The oil level should be at the bottom edge of the plug hole.

Add gear lube through the hole (Item 2) **[A]** until oil just begins to flow from the hole (Item 1) **[A]**. (See *FUEL, COOLANT AND LUBRICANT Chart,* Page 81 for the capacity and type.)

Install the plugs.

Repeat the procedure for the other side.



Draining Final Drive Case

See the *SERVICE SCHEDULE,* Page 35 for the correct service interval.

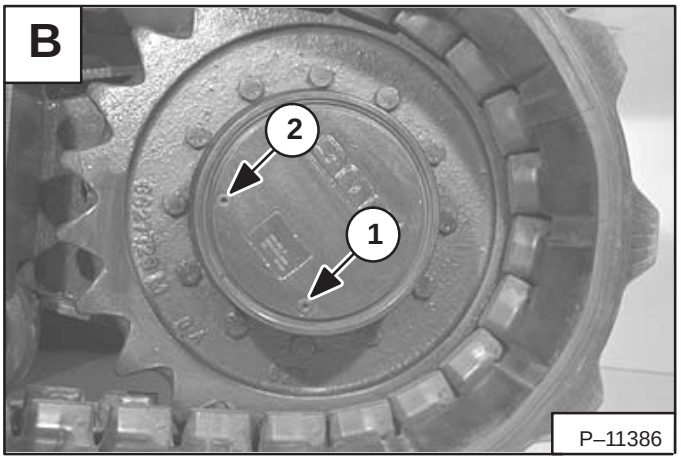
Put the machine on a level surface with the plugs positioned as shown (Item 1 & 2) **[B]**.

Remove both plugs (Items 1 & 2) **[B]** and drain into a container. Recycle or dispose of the fluid in an environmentally safe manner.

After all the gear lube is removed, install plug (Item 1) **[B]**.

Add gear lube to the plug hole (Item 2) **[B]** until the gear lube level is at the bottom edge of the plug hole (Item 2) **[B]**. Install and tighten the plugs.

Repeat the procedure for the other side.



LUBRICATION OF THE HYDRAULIC EXCAVATOR

Lubricate the Hydraulic Excavator as specified in the *SERVICE SCHEDULE,* Page 35 for the best performance of the machine.

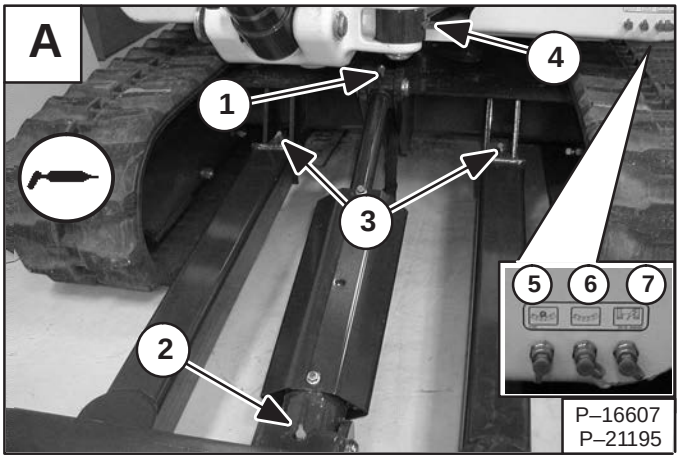
Always use a good quality lithium based multipurpose grease when lubricating the machine. Apply the lubricant until extra grease shows.

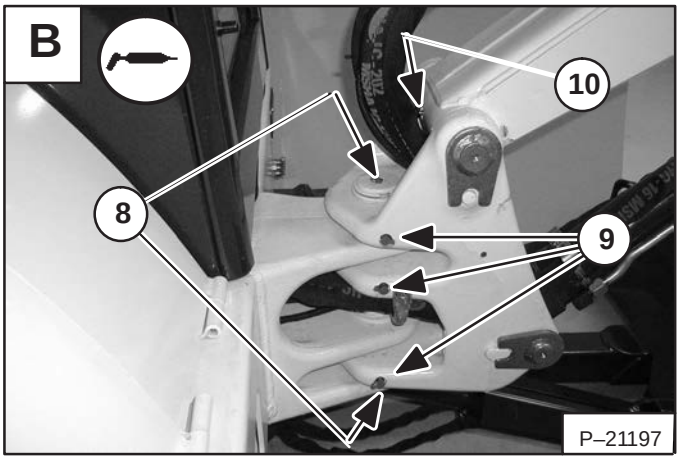
All locations, except (Items 5 & 6), must be lubricated **EVERY 8–10 HOURS:**

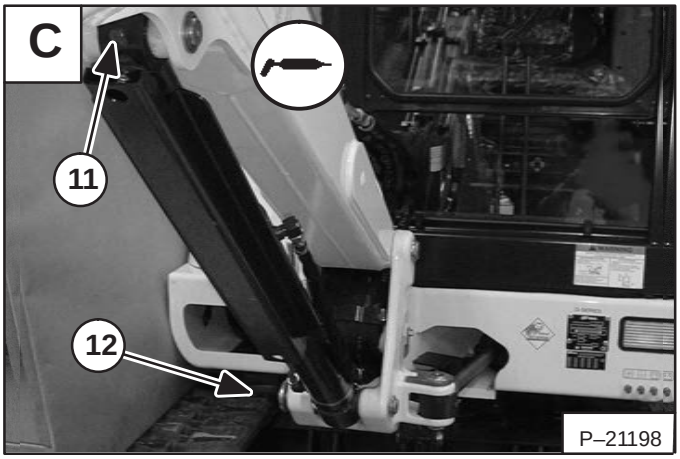
Ref. Description (# of Fittings)

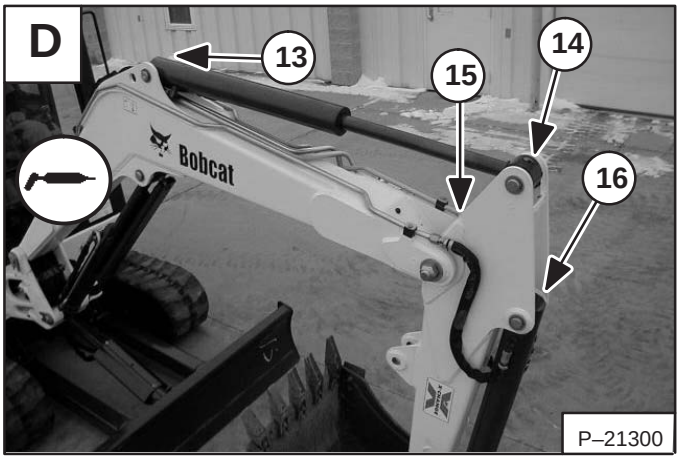
1. Blade Cylinder Rod End (1) **[A]**.
2. Blade Cylinder Base End (1) **[A]**.
3. Blade Pivots (2) **[A]**.
4. Boom Swing Cylinder Rod End (1) **[A]**.
5.* Swing Circle Pinion (1) **[A]**.
6.* Swing Circle Bearing (1) **[A].**
7. Boom Swing Cylinder Base End (1) **[A]**.
8. Boom Swing Pin (2) **[B]**.
9. Boom Swing Pivot (3) **[B]**.
10. Boom / Swing Frame Pivot (1) **[B]**.
11. Boom Cylinder Base End (1) **[C]**.
12. Boom Cylinder Rod End (1) **[C]**.
13. Arm Cylinder Base End (1) **[C]**.
14. Arm Cylinder Rod End (1) **[D]**.
15. Arm / Boom Pivot (1) **[D]**.
16. Bucket Cylinder Base End (1) **[D]**.

*Lubricate every 50 Hours. – Use 4 to 5 pumps from grease gun; rotate uppersturcture 180° and repeat.



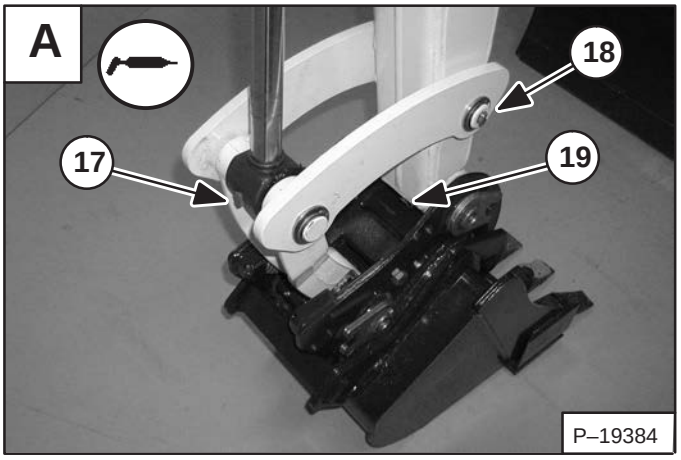






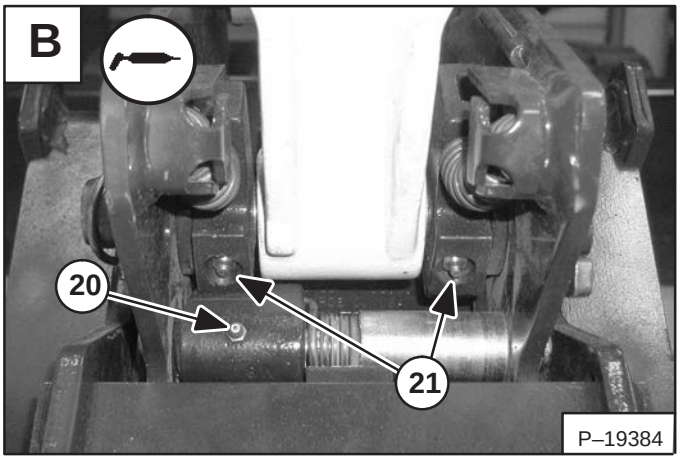
LUBRICATION OF THE HYDRAULIC EXCAVATOR (Cont'd)

Ref.	Description (# of Fittings)
17.	Bucket Cylinder Rod End (1) **[A]**.
18.	Bucket Link Pins (1) **[A]**.
19.	Bucket / Arm Pivot (1) **[A]**.



20. X–Change™ Latch (1) **[B]**
21. X–Change™ Pivot Pin (2) **[B]**.

22. (Not shown) Apply grease to slides on extendable arm (If Equipped).



Bobcat®

SYSTEM SETUP AND ANALYSIS

Bobcat®

SERVICE CODES

The LCD (Liquid Crystal Display) on the Right Instrument Panel can change from engine hours to SERVICE CODES (See at right.). These CODES help your dealership analyze monitored functions of your Bobcat excavator. Some service procedures must be performed ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL.

The Prefix, in the left two columns, followed by a Suffix, in the right two columns, will indicate a Function Error.

EXAMPLE: 02–17

Press and hold LIGHTS Button (Item 10) **[A]** (Page 4) for three seconds to view SERVICE CODES in the LCD (Item 12) **[A]** (Page 4). If more than one SERVICE CODE is present, the codes will scroll on the LCD

SERVICE CODES

PREFIX	FUNCTION
02	Hydraulic Charge Filter
03	Battery Voltage
04	Engine Oil Pressure
05	Hydraulic Charge Pressure
06	Engine Speed
07	Hydraulic Oil Temperature
08	Engine Coolant Temperature
09	Fuel Level
12	Front Auxiliary PWM Switch (Proportional Control)
13	Fuel Shutoff Solenoid – Secondary
14	Fuel Shutoff Solenoid – Primary
20	Two Speed
21	Glow Plugs
22	Starter Output
26	Solenoid for Front Female Coupler
27	Solenoid for Front Male Coupler
28	Diverter Valve Solenoid
31	Recovery Mode Failure (Loss of Power)
33	Constant Data (Stored Machine Information)
36	**A**ttachment **C**ontrol **D**evice (ACD) Controller
60	Secondary Thumb Switch
62	Load Moment Monitoring
63	Workgroup / Travel Console Sensor
64	Accessory Relay
65	Workgroup / Travel Lockout Solenoid
80	ACD Output A
82	ACD Output C
83	ACD Output D
84	ACD Output E
85	ACD Output F
86	ACD Output G
87	ACD Output H

SUFFIX	ERROR DESCRIPTION
02	Error ON (Detects ON when should be OFF)
03	Error OFF (Detects OFF when should be ON)
04	In Error
05	Short To Battery (Detects 12V & should not be)
06	Short To Ground
07	Open Circuit (Not grounded)
09	Low
10	High
11	Extremely High
14	Extremely Low
15	In Shutdown
16	Not Connected
17	Plugged
18	Out Of Range
21	Out Of Range High (Above detectable range of sensor)
22	Out Of Range Low (Below detectable range of sensor)
23	Not Calibrated
28	Failure

Multiple SERVICE CODES and / or Abnormal Symptoms can be caused by corroded or loose ground connection. Flashing instrument panel lights, alarm beeping, front & rear lights flashing, low battery voltage, loose battery connectors, could also indicate a poor ground. Check all grounds before performing other diagnostics.

KEYLESS CONTROLLER SETUP (CONT'D)

Software Version

With the key off, press and hold AUX HYD Button (Item 1) **[A]**. The software version will be displayed in the LCD (Item 2) **[A]**.

Passwords

All new machines with Deluxe Instrumentation arrive at Bobcat Dealerships with the panel in locked mode. This means that a password must be used to start the engine.

For security purposes, your dealer may change the password and also set it in the locked mode. Your dealer will provide you with the password.

Master Password:
A permanent, randomly selected password set at the factory which cannot be changed. This password is used for service by the Bobcat dealer if the Owner Password is not known; or to change the Owner Password.

Owner Password:
There is only one Owner Password (**CodE 0**). It must be used to change the owner or operator passwords. See below for changing the Owner Password.

Operator Password:
There can be up to three Operator Passwords (**CodE 1**, **CodE 2**, or **CodE 3**). See below for changing the Operator Password.

Password Entry (For Starting and Operating the Machine)

Press ENTER CODE Button (Item 1) **[A]**. The panel will become lighted and there will be two short beeps. **CodE** will appear on the LCD (Item 2) **[A]**.

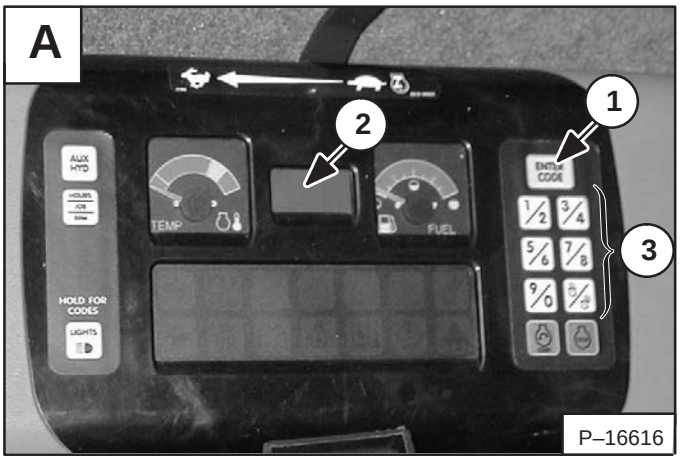
NOTE: After you press ENTER CODE you have 40 seconds to use the keypad (Item 3) **[A]** to enter the password. (If more than 40 seconds is used, the process will abort and you will need to start over.)

Enter the password. For each digit that you enter, a dash will appear on the LCD. If the password was entered correctly, there will be one long beep.

NOTE: If the password was incorrect there will be three short beeps and **Error** will appear on the LCD. Press the ENTER CODE Button again and start over. After three failed attempts, you must wait three minutes to try again.

You are now ready to start and operate the machine.

If you will be changing passwords, do not start the engine. (See *Changing The Password* at right.)



Changing The Operator Password

Perform Password Entry at left using the owner password, but do not start the engine.

Press and hold the ENTER CODE Button (Item 1) **[A]** for three seconds. **CodE 0** will appear on the LCD (Item 2) **[A]**.

Press the ENTER CODE Button until the desired Operator Code (**CodE 0, CodE 1**, **CodE 2**, **CodE 3**) appears. CodE 0 is Owner Password, the other codes are Operator Passwords. You now have 40 seconds to use the keypad (Item 3) **[A]** to enter each digit of a new four digit password.

Enter the new four digit password. After the fourth digit is entered, there will be two short beeps and **rPEAt** will appear.

Re–enter the new four digit password to verify. If the new passwords match, there will be two short beeps, **CodE** will appear for 1 second and then the LCD will return to HOURMETER function.

NOTE: If the new passwords do not match, there will be one long beep and **Error** will appear for 1 second and then the LCD will return to HOURMETER function.

KEYLESS CONTROLLER SETUP (Cont'd)

Password Lockout Feature

This allows the operator to Unlock the password feature so that a password does not need to be used every time you start the engine.

Perform Password Entry (Page 60). (The engine can be started or stopped.)

Press the Lock/Unlock Button (Item 1) **[A]**. The LCD will continuously alternate from **UnLoc** to **CodE** for 1 second periods.

Perform Password Entry again.

UnLoc will appear in the LCD (Item 5) **[A]**, the Unlocked Icon (Item 2) **[A]** will appear in the Icon Display Area (Item 3) **[A]** and there will be two short beeps.

To start an Unlocked system, press the ENTER CODE Button and press the START Button.

When you stop the engine with the system unlocked, you will hear one long beep every 3 seconds for 15 seconds.

To lock the system again, press the Lock/Unlock Button (Item 1) **[A]** and enter the password during the 15 second period.

Job Clock

The JOB CLOCK can be set to record accumulated hours for a particular job.

Press and release the HOURS/JOB/RPM Button (Item 4) **[A]** until JOB light is ON at the top, center of the LCD (Item 5) **[A]**.

While the JOB light is ON, press and hold the HOURS/JOB/RPM Button (Item 4) **[A]** until the LCD retruns to zero.

This process will clear the accumulated hours and will begin recording JOB CLOCK time again. (This does not affect the HOURMETER which continues to record the total operating hours of the excavator.)

Pressing the HOURS/JOB/RPM Button again or pressing the START Button will return the LCD to HOURMETER function.

RPM

The LCD (Item 5) **[A]** can be set to display engine RPM.

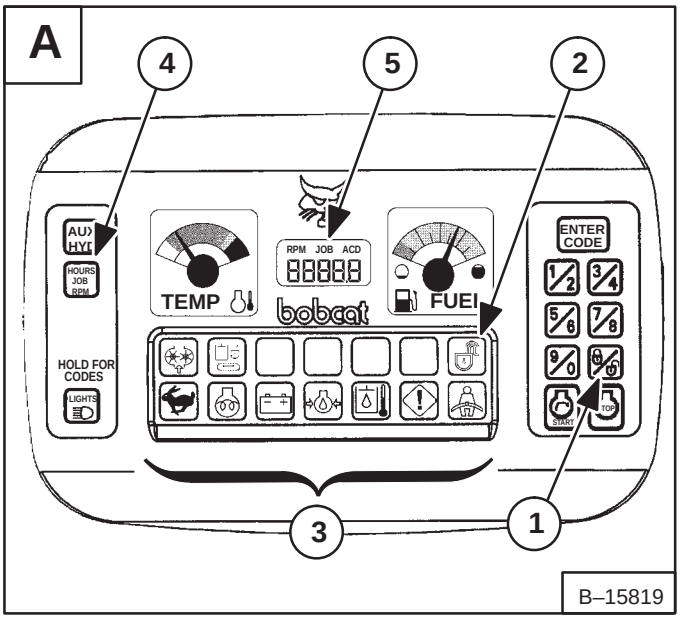
With the engine running, press and release the HOURS/JOB/RPM Button (Item 4) **[A]** until RPM light is ON at the top, left of the LCD (Item 5) **[A]**.

Engine RPM is now displayed in the LCD.

Press the HOURS/JOB/RPM Button (Item 4) **[A]** again the return to HOURMETER function.

ACD

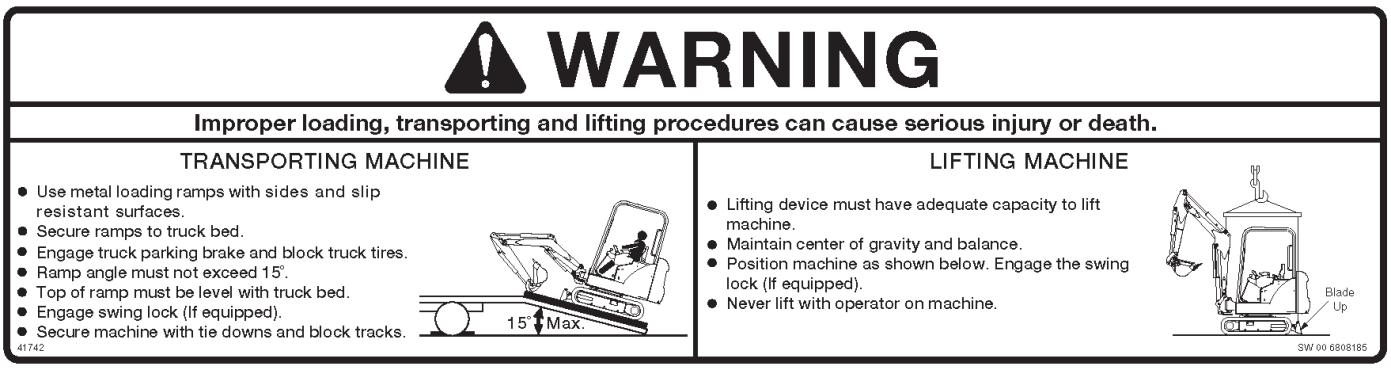
The LCD (Item 5) **[A]** will flash **ACD** when there is an error associated with an electrically controlled attachment.



Bobcat®

MACHINE SIGN TRANSLATIONS

Bobcat®



ADVERTENCIA (SPANISH)

Los procedimientos de carga, transporte e izado inadecuados pueden provocar lesiones graves o la muerte.

TRANSPORTE DE LA UNIDAD
- Use rampas metálicas de carga con entablado y superficies antideslizantes.
- Fije las rampas a la plataforma de apoyo del camión.
- Aplique el freno de estacionamiento del camión y bloquee los neumáticos del camión.
- El ángulo de la rampa no debe exceder los 15°.
- El tope de la rampa debe estar a nivel con la cama del camión.
- Empalme el bloqueo del giro.
- Amarre la unidad con cadenas de sujeción y bloquee las orugas.

PARA IZAR LA UNIDAD
- El dispositivo de izado debe tener capacidad adecuada para el peso de la unidad.
- Mantenga el centro de gravedad y el equilibrio al izar.
- No haga girar el pescante o el armazón superior. Aplique el bloqueo del giro.
- Nunca ize cuando el operador está en l a unidad.

AVERTISSEMENT (FRENCH)

Des procédures de chargement, transport et levage incorrectes risquent de provoquer des blessures graves ou la mort.

TRANSPORT DE LA MACHINE
- Utilisez une rampe de chargement métallique à surface antidérapante, munie de bordures latérales.
- Fixez la rampe à la plate-forme du camion.
- Serrez le frein de stationnement du camion et calez ses roues.
- L'angle de la rampe ne doit pas dépasser 15°.
- Le haut de la rampe doit être au niveau de la plate-forme du camion.
- Engagez le verrou de pivotement.
- Arrimez la machine avec des chaînes et calez les chenilles.

LEVAGE DE LA MACHINE

- Le dispositif de levage doit avoir la capacité suffisante pour le poids de la machine.
- Veillez à conserver le centre de gravité et l'équilibre lors du levage.
- Ne faites pas pivoter la flèche ni le châssis supérieur. Engagez le verrou de pivotement.
- Ne levez jamais la machine lorsque l'opérateur s'y trouve.

MACHINE SIGN TRANSLATION (Cont'd)

⚠ WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

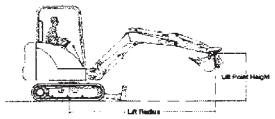
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 331

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)

BOOM LENGTH	2400 mm	(94.5 in)
ARM LENGTH	1200 mm	(47.2 in)
COUNTERWEIGHT	83.9 kg	(185 lb)
STANDARD BUCKET	609 mm	(24.0 in)
	97.5 kg	(215 lb)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg(lb.)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg(lb.)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg(lb.)			
	LIFT RADIUS - mm (in.)			LIFT @ MAXIMUM RADIUS,	LIFT RADIUS - mm (in.)			LIFT @ MAXIMUM RADIUS,	LIFT RADIUS - mm (in.)			LIFT @ MAXIMUM RADIUS,
mm (in.)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)
3000 (118.1)				*400 (881) @ 3580 (141)				*395 (870) @ 3580 (141)				*415 (915) @ 3580 (141)
2000 (78.7)		*492 (1085)	*466 (1028)	*469 (1035) @ 4070 (160)		*485 (1069)	*445 (982)	359 (791) @ 4070 (160)		*501 (1105)	325 (716)	293 (647) @ 4070 (160)
1000 (39.4)		*743 (1638)	*551 (1215)	*537 (1184) @ 4230 (166)		*718 (1583)	363 (801)	321 (708) @ 4230 (166)		524 (1156)	313 (689)	271 (598) @ 4230 (166)
Ground	*1732 (3819)	*943 (2079)	*623 (1374)	*602 (1328) @ 4090 (161)	1059 (2335)	567 (1251)	359 (791)	337 (742) @ 4090 (161)	916 (2019)	489 (1078)	290 (640)	291 (641) @ 4090 (161)
-1000 (-39.4)	*1709 (3767)	*960 (2116)		*699 (1540) @ 3820 (143)	1087 (2396)	574 (1266)		413 (911) @ 3820 (143)	936 (2064)	489 (1078)		367 (808) @ 3820 (143)

41901

* Rated Hydraulic Lift Capacity

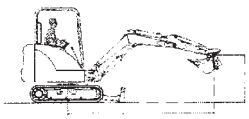
SW 00 6810008

Translation not available.

331

2400 mm (94.5 in)
1200 mm (47.2 in)
83.9 kg (185 lb)
609 mm (24.0 in)
97.5 kg (215 lb)

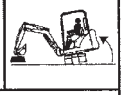
172 bar (2500 psi)
203 bar (2950 psi)



					kg(lb.)				kg(lb.)			
					mm (in.)				mm (in.)			
mm (in.)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)
3000 (118.1)				*400 (881) @ 3580 (141)				*395 (870) @ 3580 (141)				*415 (915) @ 3580 (141)
2000 (78.7)		*492 (1085)	*466 (1028)	*469 (1035) @ 4070 (160)		*485 (1069)	*445 (982)	359 (791) @ 4070 (160)		*501 (1105)	325 (716)	293 (647) @ 4070 (160)
1000 (39.4)		*743 (1638)	*551 (1215)	*537 (1184) @ 4230 (166)		*718 (1583)	363 (801)	321 (708) @ 4230 (166)		524 (1156)	313 (689)	271 (598) @ 4230 (166)
Ground	*1732 (3819)	*943 (2079)	*623 (1374)	*602 (1328) @ 4090 (161)	1059 (2335)	567 (1251)	359 (791)	337 (742) @ 4090 (161)	916 (2019)	489 (1078)	290 (640)	291 (641) @ 4090 (161)
-1000 (-39.4)	*1709 (3767)	*960 (2116)		*699 (1540) @ 3820 (143)	1087 (2396)	574 (1266)		413 (911) @ 3820 (143)	936 (2064)	489 (1078)		367 (808) @ 3820 (143)

41901

SW 00 6810008



Translation not available.

331

2400 mm (94.5 in)
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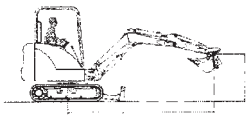
172 bar (2500 psi)
203 bar (2950 psi)



					kg(lb.)				kg(lb.)			
					mm (in.)				mm (in.)			
mm (in.)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)
3000 (118.1)				*400 (881) @ 3580 (141)				*395 (870) @ 3580 (141)				*415 (915) @ 3580 (141)
2000 (78.7)		*492 (1085)	*466 (1028)	*469 (1035) @ 4070 (160)		*485 (1069)	*445 (982)	359 (791) @ 4070 (160)		*501 (1105)	325 (716)	293 (647) @ 4070 (160)
1000 (39.4)		*743 (1638)	*551 (1215)	*537 (1184) @ 4230 (166)		*718 (1583)	363 (801)	321 (708) @ 4230 (166)		524 (1156)	313 (689)	271 (598) @ 4230 (166)
Ground	*1732 (3819)	*943 (2079)	*623 (1374)	*602 (1328) @ 4090 (161)	1059 (2335)	567 (1251)	359 (791)	337 (742) @ 4090 (161)	916 (2019)	489 (1078)	290 (640)	291 (641) @ 4090 (161)
-1000 (-39.4)	*1709 (3767)	*960 (2116)		*699 (1540) @ 3820 (143)	1087 (2396)	574 (1266)		413 (911) @ 3820 (143)	936 (2064)	489 (1078)		367 (808) @ 3820 (143)

41901

SW 00 6810008

MACHINE SIGN TRANSLATION (Cont'd)

WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

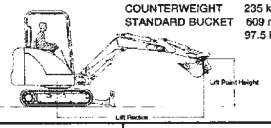
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 331E
(AND MODELS 331 OR 334 EQUIPPED WITH EXTENDIBLE ARM)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)

BOOM LENGTH	2400 mm	(94.5 in)
ARM LENGTH:		
RETRACTED	1196 mm	(47.1 in)
EXTENDED	2019 mm	(79.5 in)
COUNTERWEIGHT	235 kg	(517 lb)
STANDARD BUCKET	609 mm	(24.0 in)
	97.5 kg	(215 lb)



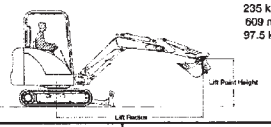
LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg (lb)					RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg (lb)					RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg (lb)				
	LIFT RADIUS - mm (in)					LIFT RADIUS - mm (in)					LIFT RADIUS - mm (in)				
	ARM RETRACTED				ARM EXTENDED	ARM RETRACTED				ARM EXTENDED	ARM RETRACTED				ARM EXTENDED
mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
3000 (118.1)				*355 (782) @ 3570 (140)	*223 (491) @ 4430 (174)				*332 (732) @ 3570 (140)	*218 (481) @ 4430 (174)				*351 (774) @ 3570 (140)	*222 (490) @ 4430 (174)
2000 (78.7)		*412 (909)	*391 (861)	*406 (894) @ 4060 (160)	*270 (596) @ 4820 (190)		*400 (881)	*351 (840)	*384 (847) @ 4060 (160)	*259 (572) @ 4820 (190)		*411 (905)	320 (706)	298 (658) @ 4060 (160)	210 (462) @ 4820 (190)
1000 (39.4)		*530 (1389)	*464 (1024)	*463(1021) @ 4220 (166)	*319 (703) @ 4960 (195)		*602 (1328)	347 (764)	311 (686) @ 4220 (166)	223 (491) @ 4950 (195)		493 (1086)	293 (645)	259 (572) @ 4220 (166)	138 (415) @ 4950 (195)
Ground	*1513 (3556)	*808 (1782)	*537 (1183)	*521 (1148) @ 4080 (161)	*377 (831) @ 4840 (190)	1056 (2327)	515 (1136)	334 (737)	322 (710) @ 4080 (161)	233 (513) @ 4840 (190)	874 (1927)	444 (978)	272 (600)	269 (593) @ 4080 (161)	187 (413) @ 4840 (190)
-1000 (-39.4)	*1500 (3528)	*921 (1810)		*610 (1345) @ 3615 (142)	*453 (999) @ 4470 (176)	1115 (2458)	543 (1196)		406 (896) @ 3615 (142)	272 (599) @ 4470 (176)	909 (2003)	440 (971)		344 (759) @ 3615 (142)	238 (524) @ 4470 (176)

43011 * Rated Hydraulic Lift Capacity SW 02 681001G

331E
331 OR 334 EQUIPPED

172 bar (2500 psi)
203 bar (2950 psi)

	2400 mm	(94.5 in)
	1196 mm	(47.1 in)
	2019 mm	(79.5 in)
	235 kg	(517 lb)
	609 mm	(24.0 in)
	97.5 kg	(215 lb)



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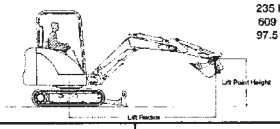
	kg (lb)					kg (lb)					kg (lb)				
	mm (in)					mm (in)					mm (in)				
mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	kg (lb) @ mm (in)
3000 (118.1)				*355 (782) @ 3570 (140)	*223 (491) @ 4430 (174)				*332 (732) @ 3570 (140)	*218 (481) @ 4430 (174)				*351 (774) @ 3570 (140)	*222 (490) @ 4430 (174)
2000 (78.7)		*412 (909)	*391 (861)	*406 (894) @ 4060 (160)	*270 (596) @ 4820 (190)		*400 (881)	*351 (840)	*384 (847) @ 4060 (160)	*259 (572) @ 4820 (190)		*411 (905)	320 (706)	298 (658) @ 4060 (160)	210 (462) @ 4820 (190)
1000 (39.4)		*530 (1389)	*464 (1024)	*463(1021) @ 4220 (166)	*319 (703) @ 4960 (195)		*602 (1328)	347 (764)	311 (686) @ 4220 (166)	223 (491) @ 4950 (195)		493 (1086)	293 (645)	259 (572) @ 4220 (166)	138 (415) @ 4950 (195)
Ground	*1513 (3556)	*808 (1782)	*537 (1183)	*521 (1148) @ 4080 (161)	*377 (831) @ 4840 (190)	1056 (2327)	515 (1136)	334 (737)	322 (710) @ 4080 (161)	233 (513) @ 4840 (190)	874 (1927)	444 (978)	272 (600)	269 (593) @ 4080 (161)	187 (413) @ 4840 (190)
-1000 (-39.4)	*1500 (3528)	*921 (1810)		*610 (1345) @ 3615 (142)	*453 (999) @ 4470 (176)	1115 (2458)	543 (1196)		406 (896) @ 3615 (142)	272 (599) @ 4470 (176)	909 (2003)	440 (971)		344 (759) @ 3615 (142)	238 (524) @ 4470 (176)

43011 SW 02 681001G

331E
331 OR 334 EQUIPPED

172 bar (2500 psi)
203 bar (2950 psi)

	2400 mm	(94.5 in)
	1196 mm	(47.1 in)
	2019 mm	(79.5 in)
	235 kg	(517 lb)
	609 mm	(24.0 in)
	97.5 kg	(215 lb)



Translation not available.

	kg (lb)					kg (lb)					kg (lb)				
	mm (in)					mm (in)					mm (in)				
mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	kg (lb) @ mm (in)
3000 (118.1)				*355 (782) @ 3570 (140)	*223 (491) @ 4430 (174)				*332 (732) @ 3570 (140)	*218 (481) @ 4430 (174)				*351 (774) @ 3570 (140)	*222 (490) @ 4430 (174)
2000 (78.7)		*412 (909)	*391 (861)	*406 (894) @ 4060 (160)	*270 (596) @ 4820 (190)		*400 (881)	*351 (840)	*384 (847) @ 4060 (160)	*259 (572) @ 4820 (190)		*411 (905)	320 (706)	298 (658) @ 4060 (160)	210 (462) @ 4820 (190)
1000 (39.4)		*530 (1389)	*464 (1024)	*463(1021) @ 4220 (166)	*319 (703) @ 4960 (195)		*602 (1328)	347 (764)	311 (686) @ 4220 (166)	223 (491) @ 4950 (195)		493 (1086)	293 (645)	259 (572) @ 4220 (166)	138 (415) @ 4950 (195)
Ground	*1513 (3556)	*808 (1782)	*537 (1183)	*521 (1148) @ 4080 (161)	*377 (831) @ 4840 (190)	1056 (2327)	515 (1136)	334 (737)	322 (710) @ 4080 (161)	233 (513) @ 4840 (190)	874 (1927)	444 (978)	272 (600)	269 (593) @ 4080 (161)	187 (413) @ 4840 (190)
-1000 (-39.4)	*1500 (3528)	*921 (1810)		*610 (1345) @ 3615 (142)	*453 (999) @ 4470 (176)	1115 (2458)	543 (1196)		406 (896) @ 3615 (142)	272 (599) @ 4470 (176)	909 (2003)	440 (971)		344 (759) @ 3615 (142)	238 (524) @ 4470 (176)

43011 SW 02 681001G

MACHINE SIGN TRANSLATION (Cont'd)

⚠ WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

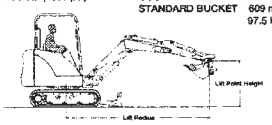
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 334
(AND MODELS 331 OR 331E EQUIPPED WITH LONG ARM)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2960 psi)

BOOM LENGTH	2400 mm	(94.5 in)
ARM LENGTH	1500 mm	(59.1 in)
COUNTERWEIGHT	235 kg	(517 lb)
STANDARD BUCKET	609 mm	(24.0 in)
	97.5 kg	(215 lb)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg (lb)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg (lb)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg (lb)			
	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)	
3000 (118.1)			*353 (779)	*360 (794) @ 3920 (154)			*342 (753)	*348 (768) @ 3920 (154)			*347 (764)	*358 (790) @ 3920 (154)
2000 (78.7)			*404 (891)	*414 (913) @ 4370 (172)			*387 (854)	*399 (879) @ 4370 (172)			*401 (883)	*310 (683) @ 4370 (172)
1000 (39.4)	*1262 (2783)	*562 (1459)	*499 (1101)	*472 (1041) @ 4510 (178)	*1220 (2689)	*640 (1412)	*478 (1053)	340 (750) @ 4510 (178)	*1248 (2752)	*649 (1431)	357 (788)	298 (656) @ 4510 (178)
Ground	*1729 (3812)	*886 (1953)	*612 (1350)	*537 (1184) @ 4390 (173)	1170 (2580)	653 (1439)	415 (914)	351(773) @ 4390 (173)	1041 (2295)	564 (1243)	354 (780)	298 (657) @ 4390 (173)
-1000 (-39.4)	*1833 (4042)	*969 (2137)		*617 (1360) @ 3960 (156)	1276 (2812)	843 (1417)		414 (913) @ 3960 (156)	1047 (2308)	548 (1209)		358 (790) @ 3960 (156)

41901

* Rated Hydraulic Lift Capacity

SW 00 6810009

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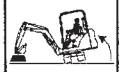
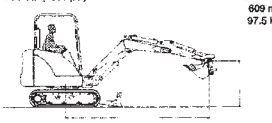


334
331 OR 331E

172 bar (2500 psi)
203 bar (2960 psi)

2400 mm (94.5 in)
1500 mm (59.1 in)
235 kg (517 lb)
609 mm (24.0 in)
97.5 kg (215 lb)



Translation not available.

	kg (lb)				kg (lb)				kg (lb)			
	mm (in)				mm (in)				mm (in)			
mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)
3000 (118.1)			*353 (779)	*360 (794) @ 3920 (154)			*342 (753)	*348 (768) @ 3920 (154)			*347 (764)	*358 (790) @ 3920 (154)
2000 (78.7)			*404 (891)	*414 (913) @ 4370 (172)			*387 (854)	*399 (879) @ 4370 (172)			*401 (883)	*310 (683) @ 4370 (172)
1000 (39.4)	*1262 (2783)	*562 (1459)	*499 (1101)	*472 (1041) @ 4510 (178)	*1220 (2689)	*640 (1412)	*478 (1053)	340 (750) @ 4510 (178)	*1248 (2752)	*649 (1431)	357 (788)	298 (656) @ 4510 (178)
Ground	*1729 (3812)	*886 (1953)	*612 (1350)	*537 (1184) @ 4390 (173)	1170 (2580)	653 (1439)	415 (914)	351(773) @ 4390 (173)	1041 (2295)	564 (1243)	354 (780)	298 (657) @ 4390 (173)
-1000 (-39.4)	*1833 (4042)	*969 (2137)		*617 (1360) @ 3960 (156)	1276 (2812)	843 (1417)		414 (913) @ 3960 (156)	1047 (2308)	548 (1209)		358 (790) @ 3960 (156)

41901

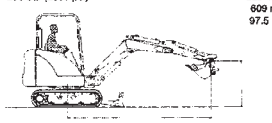
SW 00 6810009

⚠

334
331 OR 331E

172 bar (2500 psi)
203 bar (2960 psi)

2400 mm (94.5 in)
1500 mm (59.1 in)
235 kg (517 lb)
609 mm (24.0 in)
97.5 kg (215 lb)



Translation not available.

	kg (lb)				kg (lb)				kg (lb)			
	mm (in)				mm (in)				mm (in)			
mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	kg (lb) @ mm (in)
3000 (118.1)			*353 (779)	*360 (794) @ 3920 (154)			*342 (753)	*348 (768) @ 3920 (154)			*347 (764)	*358 (790) @ 3920 (154)
2000 (78.7)			*404 (891)	*414 (913) @ 4370 (172)			*387 (854)	*399 (879) @ 4370 (172)			*401 (883)	*310 (683) @ 4370 (172)
1000 (39.4)	*1262 (2783)	*562 (1459)	*499 (1101)	*472 (1041) @ 4510 (178)	*1220 (2689)	*640 (1412)	*478 (1053)	340 (750) @ 4510 (178)	*1248 (2752)	*649 (1431)	357 (788)	298 (656) @ 4510 (178)
Ground	*1729 (3812)	*886 (1953)	*612 (1350)	*537 (1184) @ 4390 (173)	1170 (2580)	653 (1439)	415 (914)	351(773) @ 4390 (173)	1041 (2295)	564 (1243)	354 (780)	298 (657) @ 4390 (173)
-1000 (-39.4)	*1833 (4042)	*969 (2137)		*617 (1360) @ 3960 (156)	1276 (2812)	843 (1417)		414 (913) @ 3960 (156)	1047 (2308)	548 (1209)		358 (790) @ 3960 (156)

41901

SW 00 6810009

SERVICE SCHEDULE

* Service only when machine is equipped with this item.
■ Service at first 50 hours, then as scheduled.
▲ Service at first 100 hours, then as scheduled.

EVERY 8-10 HOURS
Check engine coolant level.
Check engine oil level.
Check hydraulic fluid level.
Check air cleaner condition indicator.
Check and adjust track tension.
Check indicator lights for correct operation.
Check canopy or *cab condition and mounting hardware.
Check seat belt condition and mounting hardware.
Check control console(s) lockout for proper operation.
Check for damaged signs (decals) - Replace as needed.
Grease all machinery pivot points. (See illustrations)
*Apply grease to slide on extendible arm.
*Clean cab heater filter.

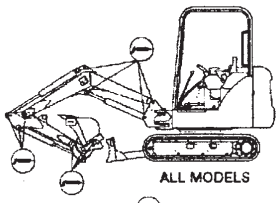
EVERY 50 HOURS
Grease swing pinion and swing circle. (See illustrations)
Drain water and sediment from fuel tank and fuel filter.
Check battery, cables and electrolyte level.

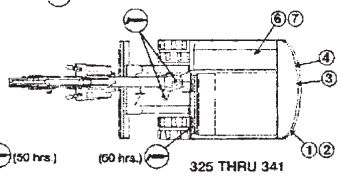
EVERY 100 HOURS
■ Check and adjust belt(s) if required.
Spark Arrestor Muffler - Clean spark chamber.
Replace engine oil and filter. (Model 320 and 322 only)

EVERY 250 HOURS
Replace diesel fuel filter.
Replace inline diesel fuel filter. (Models 430 and 435 only)
■ Replace engine oil and filter. (All models except 320, 322, 430 and 435)
Check oil level in both final drive cases. (All models except 430 and 435)

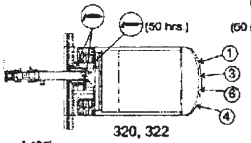
EVERY 500 HOURS
Clean radiator, oil cooler and *A/C condenser.
■ Replace engine oil and filter. (Models 430 and 435 only)
▲ Replace primary hydraulic filter.
▲ Replace case drain hydraulic filter. (All models except 320 and 322)
▲ Replace fan hydraulic filter. (Models 430 and 435 only)
Check alternator and starter connections.
Check and adjust engine valve clearance.
Replace air cleaner element. (Models 320 and 322 only)

EVERY 1000 HOURS OR EVERY 6 MONTHS
▲ Replace oil in both final drive cases. (All models except 430 and 435).
Drain and flush cooling system - Replace coolant.
Replace hydraulic fluid and filter(s) - Clean reservoir.

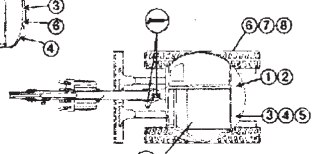

ALL MODELS



325 THRU 341



320, 322



430, 435

IMPORTANT

THIS MACHINE IS FACTORY EQUIPPED WITH A U.S.D.A. FORESTRY SERVICE APPROVED SPARK ARRESTOR MUFFLER.

IT IS NECESSARY TO CLEAN THE SPARK ARRESTOR MUFFLER TO KEEP IT IN WORKING CONDITION. THE SPARK ARRESTOR MUFFLER MUST BE SERVICED BY DUMPING THE SPARK CHAMBER EVERY 100 HOURS OF OPERATION.

IF THIS MACHINE IS OPERATED ON FLAMMABLE FOREST, BRUSH OR GRASS COVERED LAND, IT MUST BE EQUIPPED WITH A SPARK ARRESTOR ATTACHED TO THE EXHAUST SYSTEM AND MAINTAINED IN WORKING ORDER. FAILURE TO DO SO WILL BE IN VIOLATION OF CALIFORNIA STATE LAW, SECTION 4442 PRC.

REFER TO LOCAL LAWS AND REGULATIONS FOR SPARK ARRESTOR REQUIREMENTS.

FILTER CHART

		320, 322	325, 328	331, 334 331E	337, 341	430	435
1.	PRIMARY AIR FILTER	6673752	6672467	6666333	6666375	6666333	6666375
2.	SECONDARY AIR FILTER	6673753	6672468	6666334	6666376	6666334	6666376
3.	ENGINE OIL FILTER	3974113B	6675617	6675617	6675517	6675517	6675517
4.	FUEL FILTER	6667352	6667352	6667352	6667352	6667362	6667362
5.	INLINE FUEL FILTER	N/A	N/A	N/A	N/A	6633977	6633977
6.	PRIMARY HYDRAULIC FILTER	6553336	6861248	6861248	6670207	6861248	6861248
7.	CASE DRAIN HYDRAULIC FILTER	N/A	6516722	6516722	6516722	6681012	6681072
8.	FAN HYDRAULIC FILTER	N/A	N/A	N/A	N/A	6681012	6681012

* See illustrations above for filter locations.

43504 — ** See Operation & Maintenance Manual for more information and instructions.* — 8W 02 6815092

SERVICE SCHEDULE

EVERY 8-10 HOURS

Translation not available.

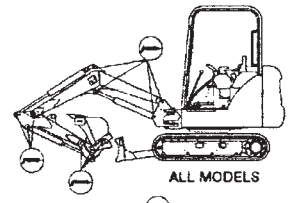
EVERY 50 HOURS

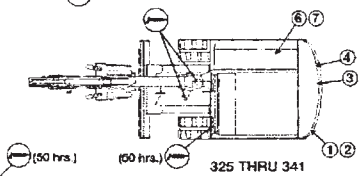
EVERY 100 HOURS

EVERY 250 HOURS

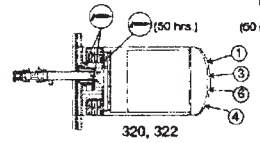
EVERY 500 HOURS

EVERY 1000 HOURS OR EVERY 6 MONTHS

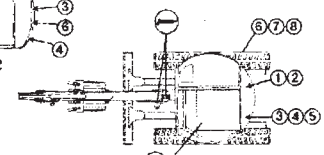

ALL MODELS



325 THRU 341



320, 322



430, 435

FILTER CHART

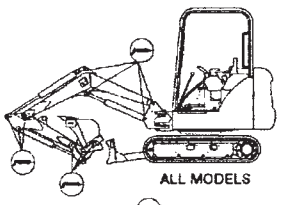
		320, 322	325, 328	331, 334 331E	337, 341	430	435
1.	PRIMARY AIR FILTER	6673752	6672467	6666333	6666375	6666333	6666375
2.	SECONDARY AIR FILTER	6673753	6672468	6666334	6666376	6666334	6666376
3.	ENGINE OIL FILTER	3974113B	6675617	6675617	6675517	6675517	6675517
4.	FUEL FILTER	6667352	6667352	6667352	6667352	6667362	6667362
5.	INLINE FUEL FILTER	N/A	N/A	N/A	N/A	6633977	6633977
6.	PRIMARY HYDRAULIC FILTER	6553336	6861248	6861248	6670207	6861248	6861248
7.	CASE DRAIN HYDRAULIC FILTER	N/A	6516722	6516722	6516722	6681012	6681072
8.	FAN HYDRAULIC FILTER	N/A	N/A	N/A	N/A	6681012	6681012

* See illustrations above for filter locations.

43504 — 8W 02 6815092

SERVICE SCHEDULE

EVERY 8-10 HOURS



ALL MODELS

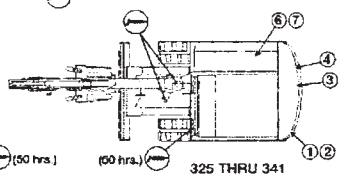
Translation not available.

EVERY 50 HOURS

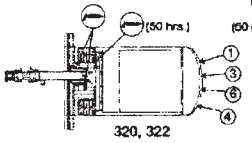
EVERY 100 HOURS

EVERY 250 HOURS

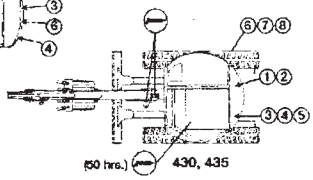
EVERY 500 HOURS



325 THRU 341



320, 322



430, 435

EVERY 1000 HOURS OR EVERY 6 MONTHS

FILTER CHART

		320, 322	325, 328	331, 334 331E	337, 341	430	435
1.	PRIMARY AIR FILTER	6673752	6672467	6666333	6666375	6666333	6666375
2.	SECONDARY AIR FILTER	6673753	6672468	6666334	6666376	6666334	6666376
3.	ENGINE OIL FILTER	3741138	6675617	6675617	6675617	6675617	6675617
4.	FUEL FILTER	6667352	6667352	6667352	6667352	6667352	6667352
5.	IN-LINE FUEL FILTER	N/A	N/A	N/A	N/A	6633977	6633977
6.	PRIMARY HYDRAULIC FILTER	6633336	6661248	6661248	6670207	6661248	6661248
7.	HYDRAULIC FILTER	N/A	6516722	6516722	6516722	6681012	6681079
8.	FAN HYDRAULIC FILTER	N/A	N/A	N/A	N/A	6681012	6681012

* See illustrations above for filter locations.

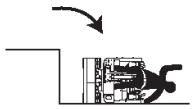
43594 SW 02 6815092

WARNING

AVOID INJURY OR DEATH

Never use Excavator without instructions.

Read Operation and Maintenance Manual and Handbook.



Always use cab/canopy.

Never modify equipment or use attachments not approved by Melroe Company.

Check for overhead or underground lines before operating.

On slopes, keep heavy end uphill.

Do not travel or turn with attachment extended.

TO LEAVE THE EXCAVATOR:

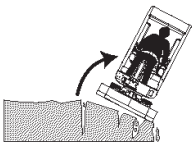
1. 
   Lower attachment.
   Never park with tracks pointed down hill.
2. 
   Stop the engine.
   Raise control console.

Fasten seat belt securely.

Keep feet and hands on controls.

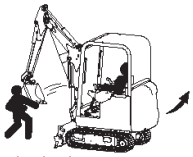
Operate controls only from operator's position.

41256



Keep away from drop-offs.

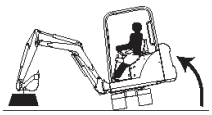
Avoid steep areas or banks that could break away.



Keep bystanders away.

No riders.

Check location of blade for direction of travel before moving steering controls.



When swinging loads:

- Keep load low.
- Swing slowly.
- Do not exceed lift capacity. Read lift capacity chart.

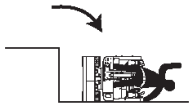
Weitere instrucktionen finden sie in der Bedienungsanleitung.

Consulte el Manual del Operador par mas instrucciónes.

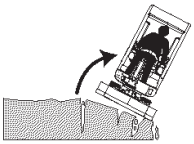
Se reporter au manual de l'opérateur pour plus de renseignements.

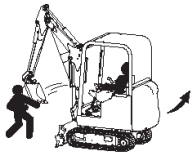
SW 00 6807776

Translation not available.



1. 
2. 





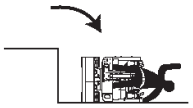
Weitere instrucktionen finden sie in der Bedienungsanleitung.

Consulte el Manual del Operador par mas instrucciónes.

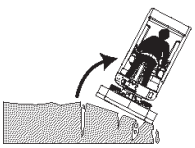
Se reporter au manual de l'opérateur pour plus de renseignements.

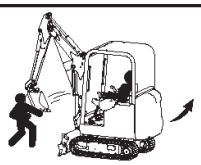
6808180

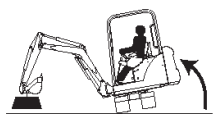
Translation not available.



1. 
2. 







Weitere instrucktionen finden sie in der Bedienungsanleitung.

Consulte el Manual del Operador par mas instrucciónes.

Se reporter au manual de l'opérateur pour plus de renseignements.

6808180

ADVERTENCIA (SPANISH)

LA GRASA A PRESIÓN ALTA PUEDE CAUSAR LESIONES SERIAS

- No afloje la grasera.
- No afloje el drenaje de la grasera más de 1-1/2 vueltas

AVERTISSEMENT (FRENCH)

GRAISSE SOUS FORTE PRESSION. RISQUE DE BLESSURES GRAVES

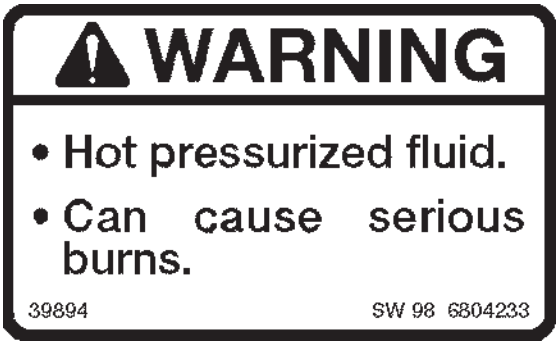
- Ne desserrez pas le graisseur.
- Ne desserrez pas le raccord de purge de plus d'un tour et demi.

ADVERTENCIA (SPANISH)

EL CILINDRO CONTIENE GAS BAJO ALTA PRESION. EL ABNRIR EL CILINDRO PUEDE SOLTAR LA VARILLA Y CAUSAR HERIDAS O LA MUERTE.

AVERTISSEMENT (FRENCH)

LES VERINS RENFERMENT UN GAZ SOUS PRESSION. NE JAMAIS OUVRIR UN VERIN CAR LA TIGE RISQUE DE S'ECHAPPER BRUTALEMENT ET DE CAUSER DES BLESSURES OU MEME LA MORT.



ADVERTENCIA (SPANISH)

- Fluido presurizado caliente.
- Puede provocar quemaduras graves.

AVERTISSEMENT (FRENCH)

- Fluide brûlant sous pression.
- Risque de brûlures graves.

ADVERTENCIA (SPANISH)

AVERTISSEMENT (FRENCH)

ADVERTENCIA (SPANISH)

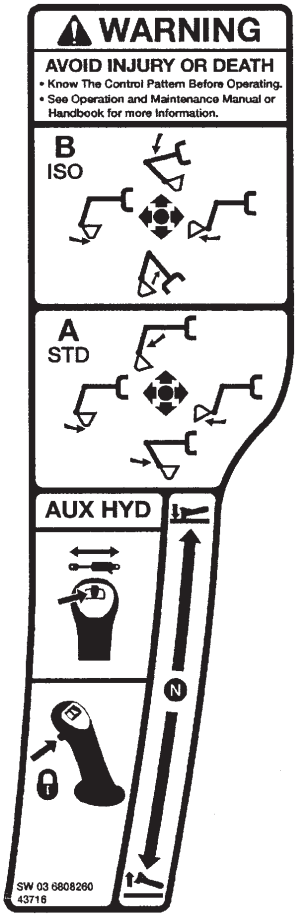
EVITE LESIONES O MUERTE

- Conozca el esquema de control antes de operar la unidad.
- Para mayor información vea el Manual de operación y mantenimiento.

AVERTISSEMENT (FRENCH)

ÉVITEZ LES BLESSURES OU LA MORT

- Avant de vous servir de la machine, assurez–vous de bien connaître la séquence de commandes à suivre.
- Voir le Manuel de l'opérateur et d'entretien ou le Guide de l'opérateur pour plus de renseignements.



ADVERTENCIA (SPANISH)

EVITE LESIONES O MUERTE

- Conozca el esquema de control antes de operar la unidad.
- Para mayor información vea el Manual de operación y mantenimiento.

AVERTISSEMENT (FRENCH)

ÉVITEZ LES BLESSURES OU LA MORT

- Avant de vous servir de la machine, assurez–vous de bien connaître la séquence de commandes à suivre.
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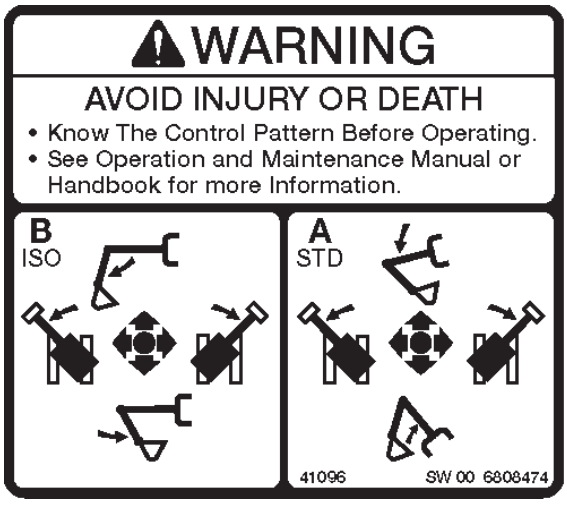


Bobcat®

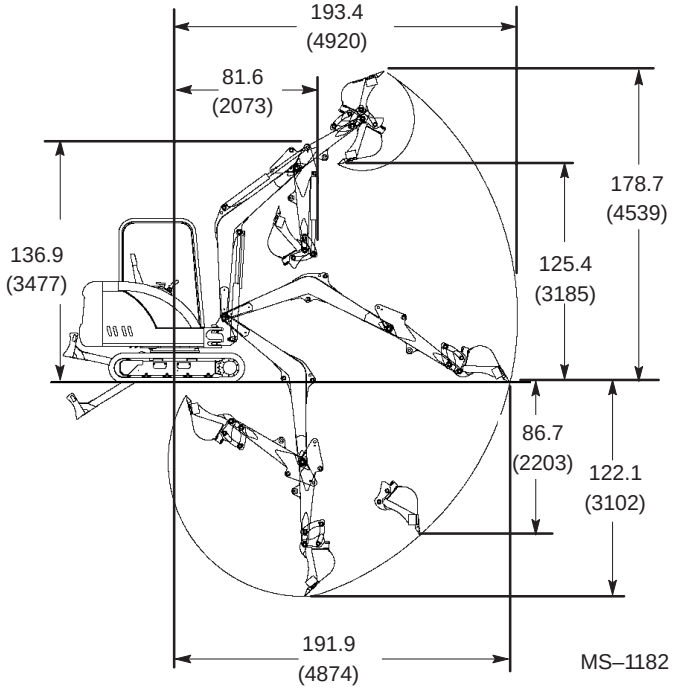
SPECIFICATIONS

Bobcat®

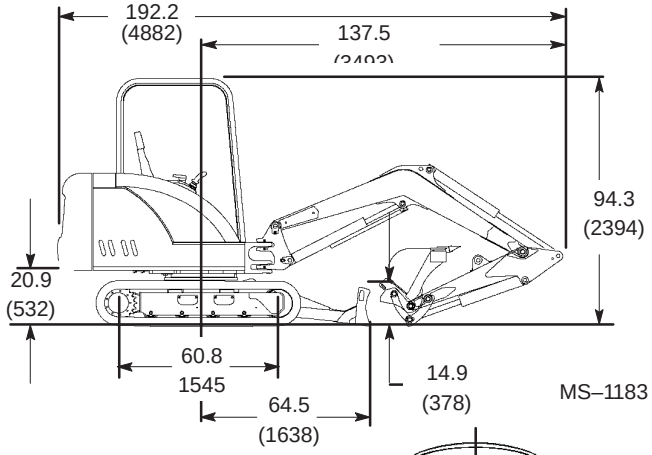
331 EXCAVATOR SPECIFICATIONS

- All dimensions are shown in inches. Respective metric dimensions (mm) are enclosed by parentheses.
- Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

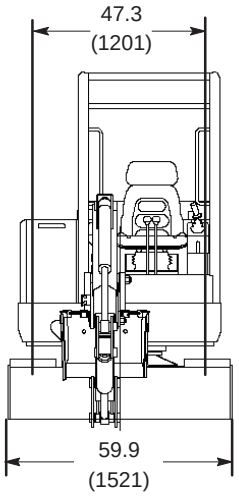
Dimensional Specifications:



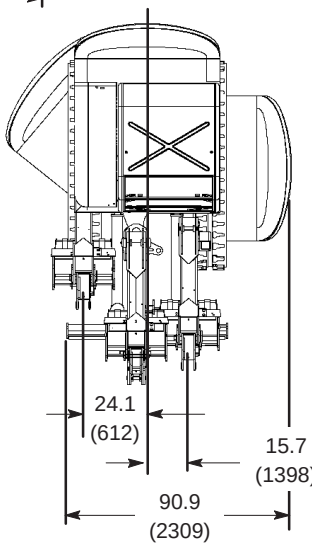
MS–1182



MS–1183



MS–1184



MS–1185

Performance Specifications:

Operating Weight w/Canopy, 20 inch Bucket, & Rubber Tracks . . . . . 7020 lbs. (3184 kg)
Add for Cab . . . . . 141 lbs. (64 kg)
Travel Speed . . . . . Low 1.3 MPH (2,1 km/hr)
High 3.5 MPH (5,6 km/hr)

Engine:

Make/Model . . . . . KUBOTA V2203–EB
Fuel/Cooling . . . . . Diesel / Liquid (Antifreeze mixture)
Horsepower (SAE Net) . . . 40 HP (29,9 kW) @ 2400 RPM
Number of Cylinders . . . . . Four
Lubrication . . . . . Pressure System W/Filter
Air Cleaner . . . . . Dry replaceable cartridge, dual element

Controls:

Steering . . . . . Two hand levers (or foot pedals)
Hydraulics . . . . . Two hand operated levers (joysticks) control boom, bucket, arm and cab swing. Blade is controller by a separate lever.
Auxiliary Hydraulics . . . . . Electric switches in joysticks
Brakes
Travel
Service & Parking . . . Hydraulic lock on motor
Swing . . . . . Spring applied, hyd.released
Service . . . . . Hydraulic lock on motor

Drive System:

Final Drive . . . . . Each track is independently driven by an Axial Piston Motor
Type of Reduction . . . . . Two–stage planetary gear reduction

Hydraulic System:

Variable Displacement
Piston Pump (One) 8.8 GPM (33,3 L/m)
Gear Pump (Two) 7.6 GPM (28,8 L/m)
Auxiliary Flow . . . . . 16.4 GPM (62,1 L/m)
System Relief Setting
Implement* Circuit 2500 PSI (172 BAR)
Travel Circuit 3500 PSI (241 BAR)
Swing Circuit 1700 PSI (117 BAR)*Boom, Arm, Bucket, Blade, Auxiliary Hydraulics

Electrical System:

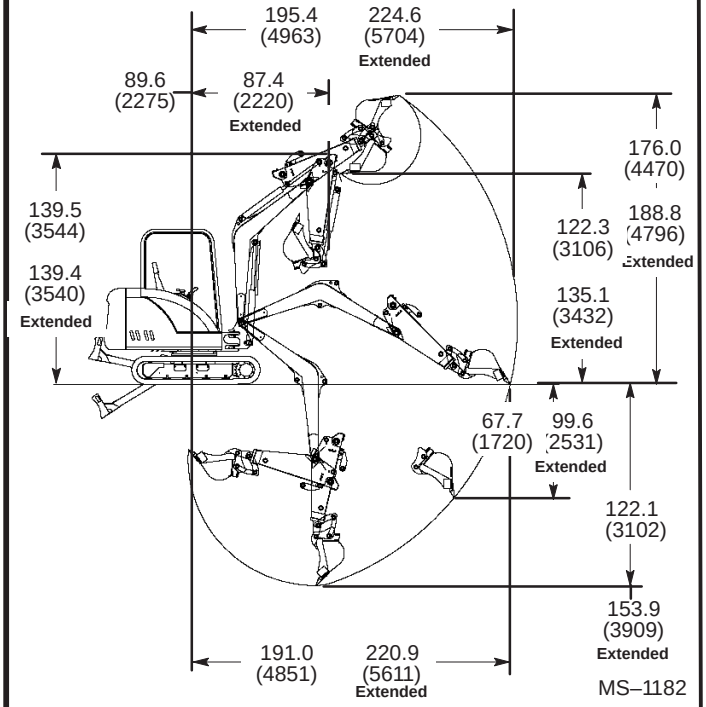
Alternator . . . . . 12–Volt, 90 amp, open, negative ground
Battery . . . . . 12 Volt – 530 CCA @ 0°F (–18°C)
Instrumentation –
Hourmeter, temperature and fuel gauges, audible alarm, and visual warning for engine functions. Optional Keyless start.

Fluid Capacities and Type – See *FUEL, COOANT AND LUBRICANTS* Page 81.

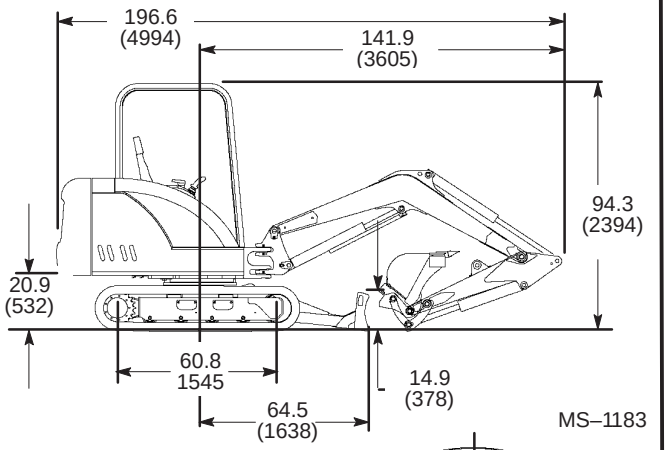
331E EXCAVATOR SPECIFICATIONS

- All dimensions are shown in inches. Respective metric dimensions (mm) are enclosed by parentheses.
- Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

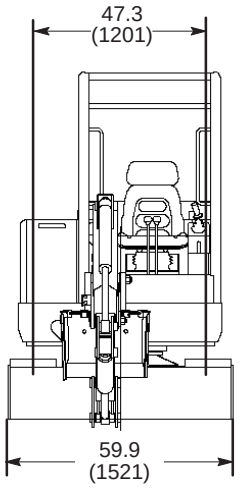
Dimensional Specifications:



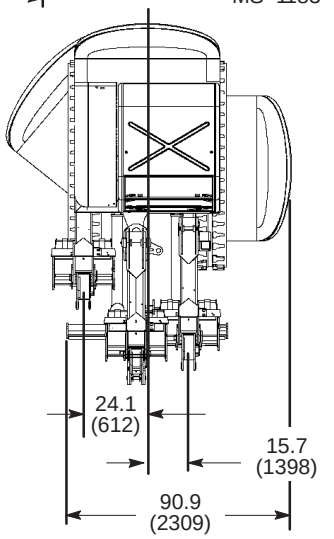
MS–1182



MS–1183



MS–1184



MS–1185

Performance Specifications:

Operating Weight w/Canopy, 20 inch Bucket,
& Rubber Tracks . . . . . 7580 lbs. (3438 kg)
Add for Cab . . . . . 141 lbs. (64 kg)
Travel Speed . . . . . Low 1.3 MPH (2,1 km/hr)
High 3.5 MPH (5,6 km/hr)

Engine:

Make/Model . . . . . KUBOTA V2203–EB
Fuel/Cooling . . . . . Diesel / Liquid (Antifreeze mixture)
Horsepower (SAE Net) . . . 40 HP (29,9 kW) @ 2400 RPM
Number of Cylinders . . . . . Four
Lubrication . . . . . Pressure System W/Filter
Air Cleaner . . . . . Dry replaceable cartridge, dual element

Controls:

Steering . . . . . Two hand levers (or foot pedals)
Hydraulics . . . . . Two hand operated levers (joysticks) control boom, bucket, arm and cab swing. Blade is controller by a separate lever.
Auxiliary Hydraulics . . . . . Electric switches in joysticks
Brakes
Travel
Service & Parking . . . Hydraulic lock on motor
Swing . . . . . Spring applied, hyd.released
Service . . . . . Hydraulic lock on motor

Drive System:

Final Drive . . . . . Each track is independently driven by an Axial Piston Motor
Type of Reduction . . . . . Two–stage planetary gear reduction

Hydraulic System:

Variable Displacement
Piston Pump (One) 8.8 GPM (33,3 L/m)
Gear Pump (Two) 7.6 GPM (28,8 L/m)
Auxiliary Flow . . . . . 16.4 GPM (62,1 L/m)
System Relief Setting
Implement* Circuit 2500 PSI (172 BAR)
Travel Circuit 3500 PSI (241 BAR)
Swing Circuit 1700 PSI (117 BAR)*Boom, Arm, Bucket, Blade, Auxiliary Hydraulics

Electrical System:

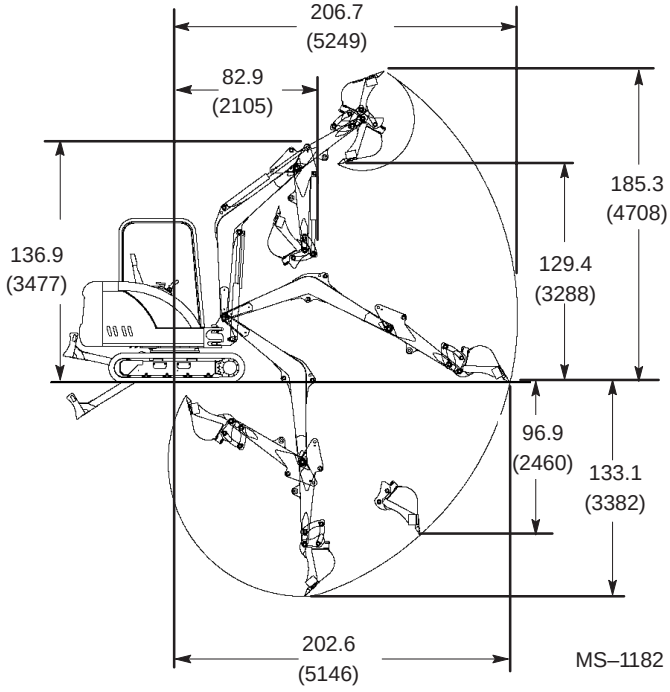
Alternator . . . . . 12–Volt, 90 amp, open, negative ground
Battery . . . . . 12 Volt – 530 CCA @ 0°F (–18°C)
Instrumentation –
Hourmeter, temperature and fuel gauges, audible alarm, and visual warning for engine functions. Optional Keyless start.

Fluid Capacities and Type – See *FUEL, COOANT AND LUBRICANTS* Page 81.

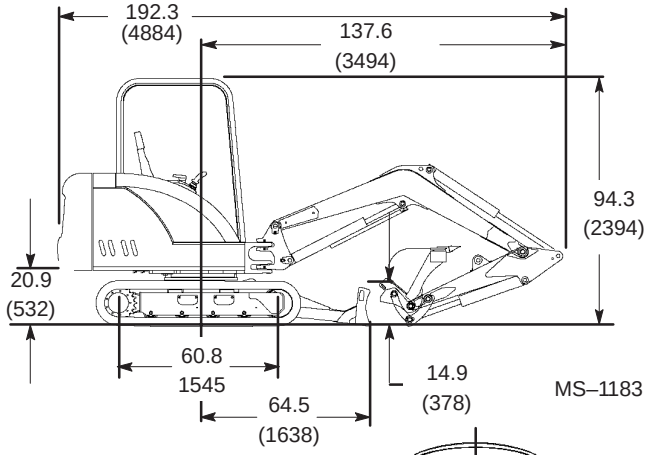
334 EXCAVATOR SPECIFICATIONS

- All dimensions are shown in inches. Respective metric dimensions (mm) are enclosed by parentheses.
- Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

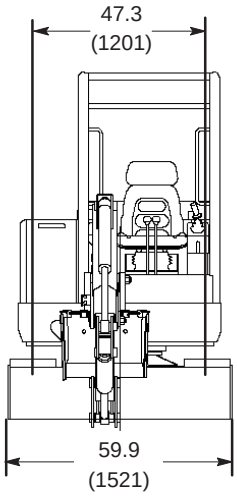
Dimensional Specifications:



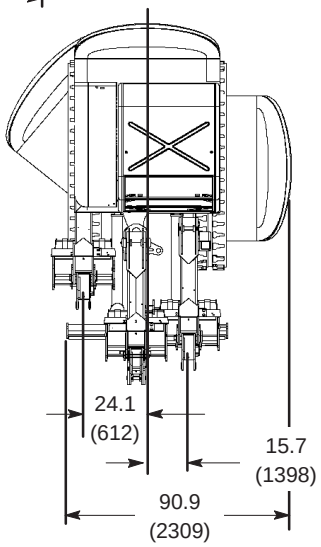
MS–1182



MS–1183



MS–1184



MS–1185

Performance Specifications:

Operating Weight w/Canopy, 20 inch Bucket, & rubber tracks	7390 lbs. (3352 kg)
Add for Cab	141 lbs. (64 kg)
Travel Speed	Low 1.3 MPH (2,1 km/hr) High 3.5 MPH (5,6 km/hr)

Engine:

Make/Model	KUBOTA V2203–EB
Fuel/Cooling	Diesel / Liquid (Antifreeze mixture)
Horsepower (SAE Net)	40 HP (29,9 kW) @ 2400 RPM
Number of Cylinders	Four
Lubrication	Pressure System W/Filter
Air Cleaner	Dry replaceable cartridge, dual element

Controls:

Steering	Two hand levers (or foot pedals)
Hydraulics	Two hand operated levers (joysticks) control boom, bucket, arm and cab swing. Blade is controller by a separate lever.
Auxiliary Hydraulics	Electric switches in joysticks
Brakes	
Travel	
Service & Parking	Hydraulic lock on motor
Swing	Spring applied, hyd.released
Service	Hydraulic lock on motor

Drive System:

Final Drive	Each track is independently driven by an Axial Piston Motor
Type of Reduction	Two–stage planetary gear reduction

Hydraulic System:

Variable Displacement	
Piston Pump (One)	8.8 GPM (33,3 L/m)
Gear Pump (Two)	7.6 GPM (28,8 L/m)
Auxiliary Flow	16.4 GPM (62,1 L/m)
System Relief Setting	
Implement* Circuit	2500 PSI (172 BAR)
Travel Circuit	3500 PSI (241 BAR)
Swing Circuit	1700 PSI (117 BAR)*Boom, Arm, Bucket, Blade, Auxiliary Hydraulics

Electrical System:

Alternator	12–Volt, 90 amp, open, negative ground
Battery	12 Volt – 530 CCA @ 0°F (–18°C)

Instrumentation –
Hourmeter, temperature and fuel gauges, audible alarm, and visual warning for engine functions. Optional Keyless start.

Fluid Capacities and Type – See *FUEL, COOANT AND LUBRICANTS* Page 81.

EXCAVATOR SPECIFICATIONS

331 Lifting Capacity

WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

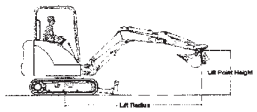
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 331

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)

BOOM LENGTH	2400 mm	(94.5 in)
ARM LENGTH	1200 mm	(47.2 in)
COUNTERWEIGHT	83.9 kg	(185 lb)
STANDARD BUCKET	609 mm	(24.0 in)
	97.5 kg	(215 lb)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg(lb.)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg(lb.)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg(lb.)			
	LIFT RADIUS - mm (in.)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in.)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in.)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
mm (in.)	2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)	
3000 (118.1)				*400 (881) @ 3580 (141)				*395 (870) @ 3580 (141)				*415 (915) @ 3580 (141)
2000 (78.7)		*492 (1085)	*466 (1028)	*469 (1035) @ 4070 (160)		*485 (1069)	*445 (982)	359 (791) @ 4070 (160)		*501 (1105)	325 (716)	293 (647) @ 4070 (160)
1000 (39.4)		*743 (1638)	*551 (1215)	*537 (1184) @ 4230 (166)		*718 (1583)	363 (801)	321 (708) @ 4230 (166)		524 (1156)	313 (689)	271 (598) @ 4230 (166)
Ground	*1732 (3819)	*943 (2079)	*623 (1374)	*602 (1328) @ 4090 (161)	1059 (2335)	567 (1251)	359 (791)	337 (742) @ 4090 (161)	916 (2019)	489 (1078)	290 (640)	291 (641) @ 4090 (161)
-1000 (-39.4)	*1709 (3767)	*960 (2116)		*699 (1540) @ 3820 (143)	1087 (2396)	574 (1266)		413 (911) @ 3620 (143)	936 (2064)	489 (1078)		367 (808) @ 3620 (143)

41901 * Rated Hydraulic Lift Capacity SW 00 6810008

331ELiftingCapacity

WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

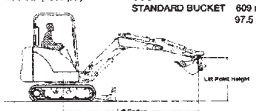
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 334 (AND MODELS 331 OR 331E EQUIPPED WITH LONG ARM)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)

BOOM LENGTH	2400 mm	(94.5 in)
ARM LENGTH	1500 mm	(59.1 in)
COUNTERWEIGHT	235 kg	(517 lb)
STANDARD BUCKET	609 mm	(24.0 in)
	97.5 kg	(215 lb)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg (lb)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg (lb)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg (lb)			
	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)	
3000 (118.1)			*353 (779)	*360 (794) @ 3920 (154)			*342 (753)	*348 (768) @ 3920 (154)			*347 (764)	*358 (790) @ 3920 (154)
2000 (78.7)			*404 (891)	*414 (913) @ 4370 (172)			*387 (854)	*399 (879) @ 4370 (172)			*401 (883)	*310 (883) @ 4370 (172)
1000 (39.4)	*1282 (2783)	*862 (1459)	*499 (1101)	*472 (1041) @ 4510 (178)	*1220 (2689)	*640 (1412)	*478 (1053)	340 (750) @ 4510 (178)	*1248 (2752)	*849 (1431)	357 (788)	298 (656) @ 4510 (178)
Ground	*1729 (3812)	*888 (1953)	*612 (1350)	*537 (1184) @ 4390 (173)	1170 (2580)	653 (1439)	415 (914)	351(773) @ 4390 (173)	1041 (2295)	564 (1243)	354 (780)	298 (657) @ 4390 (173)
-1000 (-39.4)	*1833 (4042)	*969 (2137)		*617 (1360) @ 3960 (156)	1276 (2812)	843 (1417)		414 (913) @ 3960 (156)	1047 (2308)	548 (1209)		358 (790) @ 3960 (156)

41901 * Rated Hydraulic Lift Capacity SW 00 6810009

334 Lifting Capacity

WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

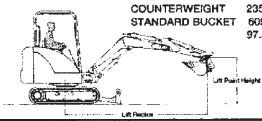
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 331E (AND MODELS 331 OR 334 EQUIPPED WITH EXTENDIBLE ARM)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)

BOOM LENGTH	2400 mm	(94.5 in)
ARM LENGTH:		
RETRACTED	1196 mm	(47.1 in)
EXTENDED	2019 mm	(79.5 in)
COUNTERWEIGHT	235 kg	(517 lb)
STANDARD BUCKET	609 mm	(24.0 in)
	97.5 kg	(215 lb)



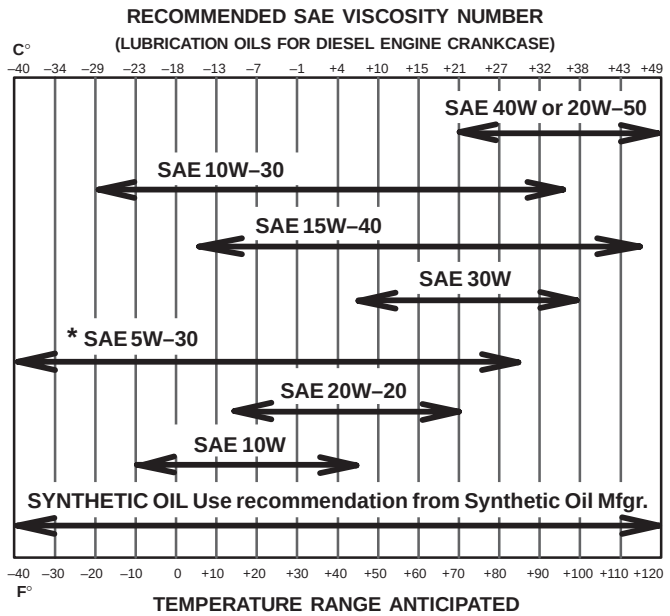
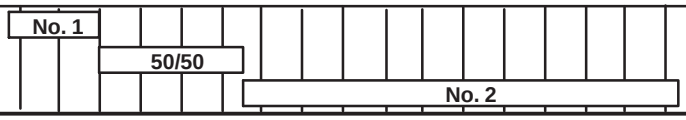
LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg (lb)					RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg (lb)					RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg (lb)				
	LIFT RADIUS - mm (in)					LIFT RADIUS - mm (in)					LIFT RADIUS - mm (in)				
	ARM RETRACTED				ARM EXTENDED	ARM RETRACTED				ARM EXTENDED	ARM RETRACTED				ARM EXTENDED
mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	2000 (78.7)	3000 (118.1)	4000 (157.5)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
3000 (118.1)				*355 (782) @ 3570 (140)	*223 (491) @ 4430 (174)				*332 (732) @ 3570 (140)	*218 (481) @ 4430 (174)				*361 (774) @ 3570 (140)	*222 (490) @ 4430 (174)
2000 (78.7)		*412 (909)	*391 (861)	*406 (894) @ 4060 (160)	*270 (596) @ 4820 (190)		*400 (881)	*381 (840)	*384 (847) @ 4060 (160)	*259 (572) @ 4820 (190)		*411 (905)	320 (706)	298 (658) @ 4060 (160)	219 (482) @ 4820 (190)
1000 (39.4)		*630 (1389)	*464 (1024)	*463(1021) @ 4220 (166)	*319 (703) @ 4950 (195)		*502 (1329)	347 (764)	311 (686) @ 4220 (166)	223 (491) @ 4950 (195)		493 (1086)	293 (645)	259 (572) @ 4220 (166)	138 (415) @ 4950 (195)
Ground	*1513 (3556)	*808 (1782)	*537 (1183)	*521 (1148) @ 4080 (161)	*377 (831) @ 4840 (190)	1056 (2327)	515 (1136)	334 (737)	322 (710) @ 4080 (161)	233 (513) @ 4840 (190)	874 (1927)	444 (978)	272 (600)	269 (593) @ 4080 (161)	187 (413) @ 4840 (190)
-1000 (-39.4)	*1600 (3528)	*921 (1819)		*610 (1345) @ 3615 (142)	*453 (999) @ 4470 (176)	1115 (2458)	543 (1196)		406 (896) @ 3615 (142)	272 (599) @ 4470 (176)	909 (2003)	440 (971)		344 (759) @ 3615 (142)	238 (524) @ 4470 (176)

43011 * Rated Hydraulic Lift Capacity SW 02 6810010

FUEL, COOLANT AND LUBRICANTS

Chart

Fuel, Coolant and Lubricants

RESERVOIR	TYPE OF FLUID	RECOMMENDED FLUIDS	CAPACITY
Engine Oil	*Use SAE Viscosity Number as Listed With API Classification CD or Better	 **TEMPERATURE RANGE ANTICIPATED BEFORE NEXT OIL CHANGE (DIESEL ENGINES MUST USE API CLASSIFICATION CD, CF4, CG4)** * Can be used **ONLY** when available with appropriate diesel rating.	7.5 qts. (7,1 L)
Fuel	*Diesel Fuel		331 – 14.1 gal. (53,4 L) 334 – 14.4 gal. (54,5 L)
Coolant (Incl. Recovery Tank)	Propylene Glycol	Add premixed coolant; 47% water and 53% **propylene glycol** to the recovery tank if the coolant level is low. One gallon and one pint of propylene glycol mixed with one gallon of water is the correct mixture of coolant to provide a –34°F (–37°C) freeze protection. Check condition with a refractometer.	Without Heater 16 qt. (15,1 L) With Heater
Hydraulic	Bobcat Fluid 6563328*	If Bobcat fluid is not available, use engine oil SAE 10W–30 or 10W–40, Class SE, or better.	System Capacity 331 – 7.8 gals. (29,5 L) 334 – 10.6 gals. (40 L)
Drive Motors (each side)	Gear Lube	SAE – 90W	1.7 qts. (1,6 L)

*** Engine Oil Change Interval Relating to Diesel Fuel Sulfur Content**

Sulfur Content	Change Interval
0.5 % or Less	Change engine oil and filter as shown on the *SERVICE SCHEDULE* Page 35.
0.5– 1.0 %	Use 1/2 of Service Schedule interval.
Above 1.0 %	Use 1/4 of Service Schedule interval.

BOBCAT APPROVED ATTACHMENTS & ACCESSORIES

These and other attachments are approved for use on this model Bobcat excavator. Do not use unapproved attachments. Attachments not manufactured by Bobcat may not be approved.

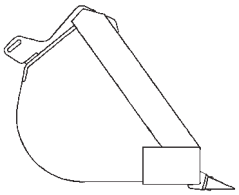
The versatile Bobcat excavator quickly turns into a multi–job machine with a variety of attachments.

See your Bobcat dealer for more details on the these and other attachments and field accessories.

Increase the versatility of your Bobcat Excavator with a variety of bucket sizes.

BUCKETS AVAILABLE

Many different bucket widths/capacities are available for a variety of applications. See your Bobcat dealer for the correct bucket for your application.

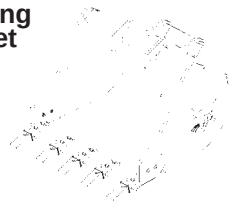


Bucket Specifications

Bucket Size	Capacity SAE Heaped	Shipping Weight
13 inch (330 mm)	2.10 cu. ft. (0.059 cu. m.)	215.5 lbs. (97,6 kg)
16 inch (406 mm)	cu. ft. (cu. m.)	lbs. (kg)
18 inch (457 mm)	cu. ft. (cu. m.)	lbs. (kg)
20 inch (508 mm)	cu. ft. (cu. m.)	lbs. (kg)
24 inch (610) mm)	cu. ft (cu. m.)	lbs. (kg)
30 inch (760 mm)	6.60 cu. ft. (0.187 cu. m.)	358.0 lbs. (162,4 kg)
36 inch (914 mm)	8.24 cu. ft. (0,234 cu. m.)	388.9 lbs. (176,4 kg)
39 inch (991 mm)	cu. ft. (cu.m.)	lbs. (kg)

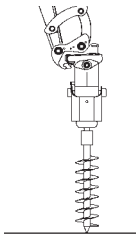
ATTACHMENTS

Trenching Bucket



Grading Bucket

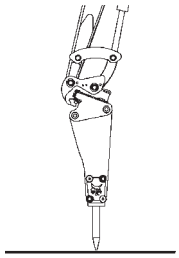
Auger (331, 331E)



TS–01942

Dig 6” – 36” holes with ease and accuracy.

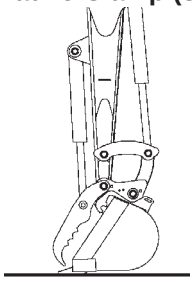
Breaker



TS–01943

Break up concrete quickly and easily.

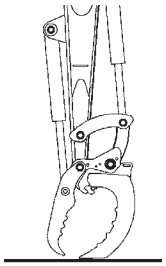
Hydraulic Clamp (331)



TS–01944

Use with a bucket to pick up debris. Requires the use of port relief valves in the auxiliary valve circuit.

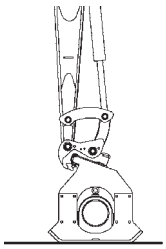
3 – Tined Grapple (331)



TS–01946

Must be used with X–Change™ system. Use with the hydraulic clamp to pick up debris, rocks, etc.

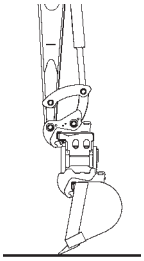
Compactor



TS–01945

Must be used with the X–Change™ system. Use for compacting soil after the excavating job is finished.

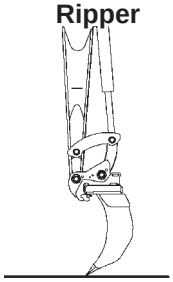
Power–Tilt



TS–01947

Must be used with the X–Change™ system. Used for rotating the bucket to cut at angles and for finishing work.

Ripper



TS–01948

Must be used with the X–Change™ system. Used for penetrating and to scarify frost or hard ground.

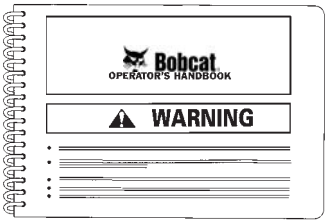
Cutter/Crusher

ADDITIONAL PUBLICATIONS and TRAINING MATERIALS

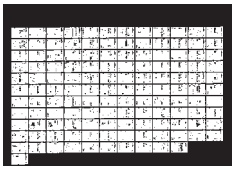
The following publications and training materials are also available for your Bobcat Compact Excavator. You can order them from your Bobcat dealer.

For the latest information on Bobcat products and the Bobcat / Ingersoll–Rand, visit our website at **www.bobcat.com**

OPERATOR'S HANDBOOK 6901071



–gives basic operation instruction and safety warnings.

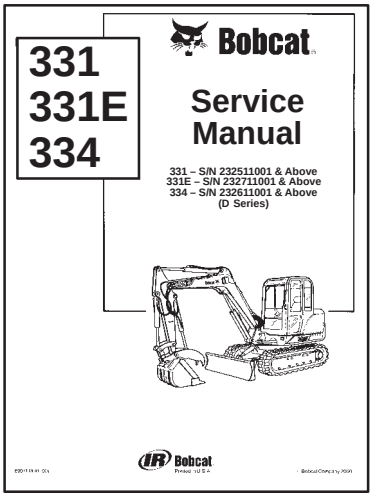


PARTS MICROFICHE

–Up–to–date PARTS information is also available. See your BOBCAT dealer.

OPERATION & MAINTENANCE MANUAL 6901957

–complete instruction on the correct operation and the routine maintenance of the Bobcat Excavator.

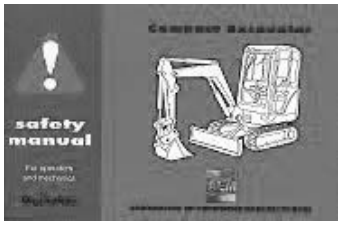


SERVICE MANUAL 6901139

–complete maintenance and overhaul instructions for your Bobcat Excavator.

COMPACT EXCAVATOR OPERATOR TRAINING COURSE
6722950–English
6900125–Spanish

–Introduces operator to step–by–step basics of Compact Excavator operation.



SAFETY MANUAL 6901951

–provides basic safety procedures and warnings for your Bobcat Excavator.

COMPACT EXCAVATOR SERVICE SAFETY COURSE
6900916

SAFETY VIDEO 6724750

–provides basic safety instructions.

Bobcat®

WARRANTY

Bobcat Excavators

Bobcat Company warrants to its authorized dealers and authorized dealers of Bobcat Equipment Ltd., who in turn warrant to the owner, that each new Bobcat Excavator will be free from proven defects in material and workmanship with respect to (i) all components of the product except as otherwise specified herein for twelve (12) months, (ii) tracks for twelve (12) months on a prorated basis based on the remaining depth of the track at the time any defect is discovered, and (iii) Bobcat brand batteries, for an additional twelve (12) months after the initial twelve month warranty period, provided that Bobcat Company shall only reimburse a fixed portion of the cost of replacing the battery during such additional twelve months. The foregoing time periods shall all commence after delivery by the authorized Bobcat dealer to the original buyer.

During the warranty period, the authorized Bobcat dealer shall repair or replace, at Bobcat Company's option, without charge for parts and labor, any part of the Bobcat product except as otherwise specified herein which fails because of defects in material or workmanship. The owner shall provide the authorized Bobcat dealer with prompt written notice of the defect and allow reasonable time for repair or replacement. Bobcat Company may, at its option, require failed parts to be returned to the factory. Travel time of mechanics and transportation of the Bobcat product to the authorized Bobcat dealer for warranty work are the responsibility of the owner. The remedies provided in this warranty are exclusive.

This warranty does not apply to diesel engine fuel injection pumps and injectors. The owner shall rely solely on the warranty, if any, of the respective manufacturers thereof. This warranty does not cover replacement of scheduled service items such as oil, filters, tune–up parts, and other high–wear items. This warranty does not cover damages resulting from abuse, accidents, alterations, use of the Bobcat product with any accessory or attachment not approved by Bobcat Company, air flow obstructions, or failure to maintain or use the Bobcat product according to the instructions applicable to it.

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